# Department of Defense
# Fiscal Year (FY) 2018 Budget Estimates

May 2017

## Navy

*Justification Book Volume 5 of 5*

## *Research, Development, Test & Evaluation, Navy*

## Budget Activity 7

The estimated cost for this report for the Department of Navy (DON) is $15,288.

The estimated total cost for supporting the DON budget justification material is approximately $1,142,960 for the 2017 fiscal year. This includes $76,659 in supplies and $1,066,301 in labor.

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**Budget Activity 4.....Volume 2**

**Budget Activity 5.....Volume 3**

**Budget Activity 6.....Volume 4**

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## Research, Development, Test and Evaluation, Navy

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $18,805,400,000 to remain available for obligation until September 30, 2019.

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Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| Appropriation | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO |
|---|---|---|---|---|---|---|---|
| Research, Development, Test & Eval, Navy | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |
| Total Research, Development, Test & Evaluation | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |
| Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title | | | | | | | |
| National Defense Sealift Fund | 36,289 | | | | | | |
| Total Not in Research, Development, Test & Evaluation | 36,289 | | | | | | |

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| Appropriation | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|---|---|
| Research, Development, Test & Eval, Navy | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |
| Total Research, Development, Test & Evaluation | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |
| Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title | | | | | | | |
| National Defense Sealift Fund | | | | | 18,622 | | 18,622 |
| Total Not in Research, Development, Test & Evaluation | | | | | 18,622 | | 18,622 |

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| Summary Recap of Budget Activities | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO |
|---|---|---|---|---|---|---|---|
| Basic Research | 648,642 | 542,970 | 542,970 | | | | |
| Applied Research | 951,575 | 861,151 | 861,151 | | | | |
| Advanced Technology Development | 680,933 | 736,988 | 736,988 | | | | |
| Advanced Component Development & Prototypes | 4,929,981 | 4,662,867 | 4,707,367 | 41,897 | 77,397 | | 77,397 |
| System Development & Demonstration | 6,236,999 | 6,025,655 | 6,112,003 | | | | |
| Management Support | 1,286,493 | 853,736 | 918,322 | | | | |
| Operational Systems Development | 3,598,418 | 3,592,934 | 3,697,066 | 36,426 | 128,626 | | 128,626 |
| Undistributed | | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 |
| Total Research, Development, Test & Evaluation | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |
| **Summary Recap of FYDP Programs** | | | | | | | |
| Strategic Forces | 162,023 | 196,948 | 196,948 | | | | |
| General Purpose Forces | 1,328,376 | 1,447,043 | 1,514,004 | | | | |
| Intelligence and Communications | 818,572 | 713,042 | 713,042 | | | | |
| Research and Development | 14,468,006 | 13,638,282 | 13,833,716 | 41,897 | 77,397 | | 77,397 |
| Central Supply and Maintenance | 27,563 | 52,526 | 52,526 | | | | |
| Administration and Associated Activities | 569 | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 |
| Space | | | | | | | |
| Classified Programs | 1,527,932 | 1,228,460 | 1,265,631 | 36,426 | 128,626 | | 128,626 |
| Total Research, Development, Test & Evaluation | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| Summary Recap of Budget Activities | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|---|---|
| Basic Research | 542,970 | 542,970 | | 542,970 | 595,901 | | 595,901 |
| Applied Research | 861,151 | 861,151 | | 861,151 | 886,079 | | 886,079 |
| Advanced Technology Development | 736,988 | 736,988 | | 736,988 | 686,342 | | 686,342 |
| Advanced Component Development & Prototypes | 4,704,764 | 4,784,764 | | 4,784,764 | 4,218,714 | 27,710 | 4,246,424 |
| System Development & Demonstration | 6,025,655 | 6,112,003 | | 6,112,003 | 6,362,102 | | 6,362,102 |
| Management Support | 853,736 | 918,322 | | 918,322 | 945,757 | | 945,757 |
| Operational Systems Development | 3,629,360 | 3,825,692 | | 3,825,692 | 3,980,140 | 102,655 | 4,082,795 |
| Undistributed | 757,941 | 757,941 | | 757,941 | | | |
| Total Research, Development, Test & Evaluation | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |
| **Summary Recap of FYDP Programs** | | | | | | | |
| Strategic Forces | 196,948 | 196,948 | | 196,948 | 201,735 | | 201,735 |
| General Purpose Forces | 1,447,043 | 1,514,004 | | 1,514,004 | 1,675,797 | 12,800 | 1,688,597 |
| Intelligence and Communications | 713,042 | 713,042 | | 713,042 | 751,779 | | 751,779 |
| Research and Development | 13,680,179 | 13,911,113 | | 13,911,113 | 13,589,349 | 27,710 | 13,617,059 |
| Central Supply and Maintenance | 52,526 | 52,526 | | 52,526 | 43,035 | | 43,035 |
| Administration and Associated Activities | 757,941 | 757,941 | | 757,941 | 1,749 | | 1,749 |
| Space | | | | | 47,244 | | 47,244 |
| Classified Programs | 1,264,886 | 1,394,257 | | 1,394,257 | 1,364,347 | 89,855 | 1,454,202 |
| Total Research, Development, Test & Evaluation | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO |
|---|---|---|---|---|---|---|---|
| Summary Recap of Non-RDT&E Title FYDP Programs | | | | | | | |
| Mobility Forces | 36,289 | | | | | | |
| Total Research, Development, Test & Evaluation | 36,289 | | | | | | |

Department of Defense
FY 2018 President's Budget Request
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(Dollars in Thousands)

| | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|---|---|
| Summary Recap of Non-RDT&E Title FYDP Programs | | | | | | | |
| Mobility Forces | | | | | 18,622 | | 18,622 |
| Total Research, Development, Test & Evaluation | | | | | 18,622 | | 18,622 |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

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|---|---|---|---|---|---|---|---|
| Basic Research | 648,642 | 542,970 | 542,970 | | | | |
| Applied Research | 951,575 | 861,151 | 861,151 | | | | |
| Advanced Technology Development | 680,933 | 736,988 | 736,988 | | | | |
| Advanced Component Development & Prototypes | 4,929,981 | 4,662,867 | 4,707,367 | 41,897 | 77,397 | | 77,397 |
| System Development & Demonstration | 6,236,999 | 6,025,655 | 6,112,003 | | | | |
| Management Support | 1,286,493 | 853,736 | 918,322 | | | | |
| Operational Systems Development | 3,598,418 | 3,592,934 | 3,697,066 | 36,426 | 128,626 | | 128,626 |
| Undistributed | | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 |
| Total Research, Development, Test & Evaluation | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |
| **Summary Recap of FYDP Programs** | | | | | | | |
| Strategic Forces | 162,023 | 196,948 | 196,948 | | | | |
| General Purpose Forces | 1,328,376 | 1,447,043 | 1,514,004 | | | | |
| Intelligence and Communications | 818,572 | 713,042 | 713,042 | | | | |
| Research and Development | 14,468,006 | 13,638,282 | 13,833,716 | 41,897 | 77,397 | | 77,397 |
| Central Supply and Maintenance | 27,563 | 52,526 | 52,526 | | | | |
| Administration and Associated Activities | 569 | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 |
| Space | | | | | | | |
| Classified Programs | 1,527,932 | 1,228,460 | 1,265,631 | 36,426 | 128,626 | | 128,626 |
| Total Research, Development, Test & Evaluation | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

| Summary Recap of Budget Activities | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|---|---|
| Basic Research | 542,970 | 542,970 | | 542,970 | 595,901 | | 595,901 |
| Applied Research | 861,151 | 861,151 | | 861,151 | 886,079 | | 886,079 |
| Advanced Technology Development | 736,988 | 736,988 | | 736,988 | 686,342 | | 686,342 |
| Advanced Component Development & Prototypes | 4,704,764 | 4,784,764 | | 4,784,764 | 4,218,714 | 27,710 | 4,246,424 |
| System Development & Demonstration | 6,025,655 | 6,112,003 | | 6,112,003 | 6,362,102 | | 6,362,102 |
| Management Support | 853,736 | 918,322 | | 918,322 | 945,757 | | 945,757 |
| Operational Systems Development | 3,629,360 | 3,825,692 | | 3,825,692 | 3,980,140 | 102,655 | 4,082,795 |
| Undistributed | 757,941 | 757,941 | | 757,941 | | | |
| Total Research, Development, Test & Evaluation | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |
| **Summary Recap of FYDP Programs** | | | | | | | |
| Strategic Forces | 196,948 | 196,948 | | 196,948 | 201,735 | | 201,735 |
| General Purpose Forces | 1,447,043 | 1,514,004 | | 1,514,004 | 1,675,797 | 12,800 | 1,688,597 |
| Intelligence and Communications | 713,042 | 713,042 | | 713,042 | 751,779 | | 751,779 |
| Research and Development | 13,680,179 | 13,911,113 | | 13,911,113 | 13,589,349 | 27,710 | 13,617,059 |
| Central Supply and Maintenance | 52,526 | 52,526 | | 52,526 | 43,035 | | 43,035 |
| Administration and Associated Activities | 757,941 | 757,941 | | 757,941 | 1,749 | | 1,749 |
| Space | | | | | 47,244 | | 47,244 |
| Classified Programs | 1,264,886 | 1,394,257 | | 1,394,257 | 1,364,347 | 89,855 | 1,454,202 |
| Total Research, Development, Test & Evaluation | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601103N | University Research Initiatives | 01 | 140,998 | 101,714 | 101,714 | | | | | U |
| 2 | 0601152N | In-House Laboratory Independent Research | 01 | 18,978 | 18,508 | 18,508 | | | | | U |
| 3 | 0601153N | Defense Research Sciences | 01 | 488,666 | 422,748 | 422,748 | | | | | U |
| | Basic Research | | | 648,642 | 542,970 | 542,970 | | | | | |
| 4 | 0602114N | Power Projection Applied Research | 02 | 88,940 | 41,371 | 41,371 | | | | | U |
| 5 | 0602123N | Force Protection Applied Research | 02 | 174,447 | 158,745 | 158,745 | | | | | U |
| 6 | 0602131M | Marine Corps Landing Force Technology | 02 | 50,164 | 51,590 | 51,590 | | | | | U |
| 7 | 0602235N | Common Picture Applied Research | 02 | 42,973 | 41,185 | 41,185 | | | | | U |
| 8 | 0602236N | Warfighter Sustainment Applied Research | 02 | 44,092 | 45,467 | 45,467 | | | | | U |
| 9 | 0602271N | Electromagnetic Systems Applied Research | 02 | 116,362 | 118,941 | 118,941 | | | | | U |
| 10 | 0602435N | Ocean Warfighting Environment Applied Research | 02 | 69,703 | 42,618 | 42,618 | | | | | U |
| 11 | 0602651M | Joint Non-Lethal Weapons Applied Research | 02 | 5,956 | 6,327 | 6,327 | | | | | U |
| 12 | 0602747N | Undersea Warfare Applied Research | 02 | 151,844 | 126,313 | 126,313 | | | | | U |
| 13 | 0602750N | Future Naval Capabilities Applied Research | 02 | 172,511 | 165,103 | 165,103 | | | | | U |
| 14 | 0602782N | Mine and Expeditionary Warfare Applied Research | 02 | 34,583 | 33,916 | 33,916 | | | | | U |
| 15 | 0602792N | Innovative Naval Prototypes (INP) Applied Research | 02 | | | | | | | | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0601103N | University Research Initiatives | 01 | 101,714 | 101,714 | | 101,714 | 118,130 | | 118,130 | U |
| 2 | 0601152N | In-House Laboratory Independent Research | 01 | 18,508 | 18,508 | | 18,508 | 19,438 | | 19,438 | U |
| 3 | 0601153N | Defense Research Sciences | 01 | 422,748 | 422,748 | | 422,748 | 458,333 | | 458,333 | U |
| | Basic | Research | | 542,970 | 542,970 | | 542,970 | 595,901 | | 595,901 | |
| 4 | 0602114N | Power Projection Applied Research | 02 | 41,371 | 41,371 | | 41,371 | 13,553 | | 13,553 | U |
| 5 | 0602123N | Force Protection Applied Research | 02 | 158,745 | 158,745 | | 158,745 | 125,557 | | 125,557 | U |
| 6 | 0602131M | Marine Corps Landing Force Technology | 02 | 51,590 | 51,590 | | 51,590 | 53,936 | | 53,936 | U |
| 7 | 0602235N | Common Picture Applied Research | 02 | 41,185 | 41,185 | | 41,185 | 36,450 | | 36,450 | U |
| 8 | 0602236N | Warfighter Sustainment Applied Research | 02 | 45,467 | 45,467 | | 45,467 | 48,649 | | 48,649 | U |
| 9 | 0602271N | Electromagnetic Systems Applied Research | 02 | 118,941 | 118,941 | | 118,941 | 79,598 | | 79,598 | U |
| 10 | 0602435N | Ocean Warfighting Environment Applied Research | 02 | 42,618 | 42,618 | | 42,618 | 42,411 | | 42,411 | U |
| 11 | 0602651M | Joint Non-Lethal Weapons Applied Research | 02 | 6,327 | 6,327 | | 6,327 | 6,425 | | 6,425 | U |
| 12 | 0602747N | Undersea Warfare Applied Research | 02 | 126,313 | 126,313 | | 126,313 | 56,094 | | 56,094 | U |
| 13 | 0602750N | Future Naval Capabilities Applied Research | 02 | 165,103 | 165,103 | | 165,103 | 156,805 | | 156,805 | U |
| 14 | 0602782N | Mine and Expeditionary Warfare Applied Research | 02 | 33,916 | 33,916 | | 33,916 | 32,733 | | 32,733 | U |
| 15 | 0602792N | Innovative Naval Prototypes (INP) Applied Research | 02 | | | | | 171,146 | | 171,146 | U |

Department of the Navy
FY 2018 President's Budget Request
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(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 0602861N | Science and Technology Management - ONR Field Acitivities | 02 | | | | | | | | U |
| 17 | 0602898N | Science and Technology Management - ONR Headquarters | 02 | | 29,575 | 29,575 | | | | | U |
| | | Applied Research | | 951,575 | 861,151 | 861,151 | | | | | |
| 18 | 0603114N | Power Projection Advanced Technology | 03 | 41,957 | 96,406 | 96,406 | | | | | U |
| 19 | 0603123N | Force Protection Advanced Technology | 03 | 42,333 | 48,438 | 48,438 | | | | | U |
| 20 | 0603271N | Electromagnetic Systems Advanced Technology | 03 | 32,924 | 26,421 | 26,421 | | | | | U |
| 21 | 0603640M | USMC Advanced Technology Demonstration (ATD) | 03 | 128,386 | 140,416 | 140,416 | | | | | U |
| 22 | 0603651M | Joint Non-Lethal Weapons Technology Development | 03 | 12,374 | 13,117 | 13,117 | | | | | U |
| 23 | 0603673N | Future Naval Capabilities Advanced Technology Development | 03 | 251,173 | 249,092 | 249,092 | | | | | U |
| 24 | 0603680N | Manufacturing Technology Program | 03 | 54,739 | 56,712 | 56,712 | | | | | U |
| 25 | 0603729N | Warfighter Protection Advanced Technology | 03 | 34,894 | 4,789 | 4,789 | | | | | U |
| 26 | 0603747N | Undersea Warfare Advanced Technology | 03 | 13,251 | 25,880 | 25,880 | | | | | U |
| 27 | 0603758N | Navy Warfighting Experiments and Demonstrations | 03 | 65,553 | 60,550 | 60,550 | | | | | U |
| 28 | 0603782N | Mine and Expeditionary Warfare Advanced Technology | 03 | 3,349 | 15,167 | 15,167 | | | | | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
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(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 0602861N | Science and Technology Management - ONR Field Acitivities | 02 | | | | | 62,722 | | 62,722 | U |
| 17 | 0602898N | Science and Technology Management - ONR Headquarters | 02 | 29,575 | 29,575 | | 29,575 | | | | U |
| | Applied Research | | | 861,151 | 861,151 | | 861,151 | 886,079 | | 886,079 | |
| 18 | 0603114N | Power Projection Advanced Technology | 03 | 96,406 | 96,406 | | 96,406 | | | | U |
| 19 | 0603123N | Force Protection Advanced Technology | 03 | 48,438 | 48,438 | | 48,438 | 26,342 | | 26,342 | U |
| 20 | 0603271N | Electromagnetic Systems Advanced Technology | 03 | 26,421 | 26,421 | | 26,421 | 9,360 | | 9,360 | U |
| 21 | 0603640M | USMC Advanced Technology Demonstration (ATD) | 03 | 140,416 | 140,416 | | 140,416 | 154,407 | | 154,407 | U |
| 22 | 0603651M | Joint Non-Lethal Weapons Technology Development | 03 | 13,117 | 13,117 | | 13,117 | 13,448 | | 13,448 | U |
| 23 | 0603673N | Future Naval Capabilities Advanced Technology Development | 03 | 249,092 | 249,092 | | 249,092 | 231,772 | | 231,772 | U |
| 24 | 0603680N | Manufacturing Technology Program | 03 | 56,712 | 56,712 | | 56,712 | 57,797 | | 57,797 | U |
| 25 | 0603729N | Warfighter Protection Advanced Technology | 03 | 4,789 | 4,789 | | 4,789 | 4,878 | | 4,878 | U |
| 26 | 0603747N | Undersea Warfare Advanced Technology | 03 | 25,880 | 25,880 | | 25,880 | | | | U |
| 27 | 0603758N | Navy Warfighting Experiments and Demonstrations | 03 | 60,550 | 60,550 | | 60,550 | 64,889 | | 64,889 | U |
| 28 | 0603782N | Mine and Expeditionary Warfare Advanced Technology | 03 | 15,167 | 15,167 | | 15,167 | 15,164 | | 15,164 | U |

Department of the Navy
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 0603801N | Innovative Naval Prototypes (INP) Advanced Technology Development | 03 | | | | | | | | U |
| | | Advanced Technology Development | | 680,933 | 736,988 | 736,988 | | | | | |
| 30 | 0603207N | Air/Ocean Tactical Applications | 04 | 37,126 | 48,536 | 48,536 | | | | | U |
| 31 | 0603216N | Aviation Survivability | 04 | 5,343 | 5,239 | 5,239 | | | | | U |
| 32 | 0603237N | Deployable Joint Command and Control | 04 | 3,051 | | | | | | | U |
| 33 | 0603251N | Aircraft Systems | 04 | 25,763 | 1,519 | 1,519 | | | | | U |
| 34 | 0603254N | ASW Systems Development | 04 | 5,455 | 7,041 | 7,041 | | | | | U |
| 35 | 0603261N | Tactical Airborne Reconnaissance | 04 | 8,391 | 3,274 | 3,274 | | | | | U |
| 36 | 0603382N | Advanced Combat Systems Technology | 04 | 1,572 | 57,034 | 57,034 | | | | | U |
| 37 | 0603502N | Surface and Shallow Water Mine Countermeasures | 04 | 88,092 | 165,775 | 165,775 | | | | | U |
| 38 | 0603506N | Surface Ship Torpedo Defense | 04 | 69,803 | 87,066 | 87,066 | | | | | U |
| 39 | 0603512N | Carrier Systems Development | 04 | 8,213 | 7,605 | 7,605 | | | | | U |
| 40 | 0603525N | PILOT FISH | 04 | 124,194 | 132,068 | 132,068 | | | | | U |
| 41 | 0603527N | RETRACT LARCH | 04 | 39,475 | 14,546 | 14,546 | 3,907 | 35,907 | | 35,907 | U |
| 42 | 0603536N | RETRACT JUNIPER | 04 | 109,786 | 115,435 | 115,435 | | | | | U |
| 43 | 0603542N | Radiological Control | 04 | 709 | 702 | 702 | | | | | U |
| 44 | 0603553N | Surface ASW | 04 | 1,056 | 1,081 | 1,081 | | | | | U |
| 45 | 0603561N | Advanced Submarine System Development | 04 | 85,496 | 100,565 | 106,365 | | | | | U |

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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 0603801N | Innovative Naval Prototypes (INP) Advanced Technology Development | 03 | | | | | 108,285 | | 108,285 | U |
| | | Advanced Technology Development | | 736,988 | 736,988 | | 736,988 | 686,342 | | 686,342 | |
| 30 | 0603207N | Air/Ocean Tactical Applications | 04 | 48,536 | 48,536 | | 48,536 | 48,365 | | 48,365 | U |
| 31 | 0603216N | Aviation Survivability | 04 | 5,239 | 5,239 | | 5,239 | 5,566 | | 5,566 | U |
| 32 | 0603237N | Deployable Joint Command and Control | 04 | | | | | | | | U |
| 33 | 0603251N | Aircraft Systems | 04 | 1,519 | 1,519 | | 1,519 | 695 | | 695 | U |
| 34 | 0603254N | ASW Systems Development | 04 | 7,041 | 7,041 | | 7,041 | 7,661 | | 7,661 | U |
| 35 | 0603261N | Tactical Airborne Reconnaissance | 04 | 3,274 | 3,274 | | 3,274 | 3,707 | | 3,707 | U |
| 36 | 0603382N | Advanced Combat Systems Technology | 04 | 57,034 | 57,034 | | 57,034 | 61,381 | | 61,381 | U |
| 37 | 0603502N | Surface and Shallow Water Mine Countermeasures | 04 | 165,775 | 165,775 | | 165,775 | 154,117 | | 154,117 | U |
| 38 | 0603506N | Surface Ship Torpedo Defense | 04 | 87,066 | 87,066 | | 87,066 | 14,974 | | 14,974 | U |
| 39 | 0603512N | Carrier Systems Development | 04 | 7,605 | 7,605 | | 7,605 | 9,296 | | 9,296 | U |
| 40 | 0603525N | PILOT FISH | 04 | 132,068 | 132,068 | | 132,068 | 132,083 | | 132,083 | U |
| 41 | 0603527N | RETRACT LARCH | 04 | 18,453 | 50,453 | | 50,453 | 15,407 | 22,000 | 37,407 | U |
| 42 | 0603536N | RETRACT JUNIPER | 04 | 115,435 | 115,435 | | 115,435 | 122,413 | | 122,413 | U |
| 43 | 0603542N | Radiological Control | 04 | 702 | 702 | | 702 | 745 | | 745 | U |
| 44 | 0603553N | Surface ASW | 04 | 1,081 | 1,081 | | 1,081 | 1,136 | | 1,136 | U |
| 45 | 0603561N | Advanced Submarine System Development | 04 | 100,565 | 106,365 | | 106,365 | 100,955 | | 100,955 | U |

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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 0603562N | Submarine Tactical Warfare Systems | 04 | 10,172 | 8,782 | 8,782 | | | | | U |
| 47 | 0603563N | Ship Concept Advanced Design | 04 | 10,446 | 14,590 | 14,590 | | | | | U |
| 48 | 0603564N | Ship Preliminary Design & Feasibility Studies | 04 | 3,213 | 15,805 | 15,805 | | | | | U |
| 49 | 0603570N | Advanced Nuclear Power Systems | 04 | 482,040 | 453,313 | 453,313 | | | | | U |
| 50 | 0603573N | Advanced Surface Machinery Systems | 04 | 23,443 | 36,655 | 36,655 | | | | | U |
| 51 | 0603576N | CHALK EAGLE | 04 | 493,472 | 367,016 | 367,016 | | | | | U |
| 52 | 0603581N | Littoral Combat Ship (LCS) | 04 | 109,426 | 51,630 | 51,630 | | | | | U |
| 53 | 0603582N | Combat System Integration | 04 | 32,020 | 23,530 | 26,530 | | | | | U |
| 54 | 0603595N | Ohio Replacement | 04 | 947,783 | 700,811 | 700,811 | | | | | U |
| 55 | 0603596N | LCS Mission Modules | 04 | 188,872 | 160,058 | 160,058 | | | | | U |
| 56 | 0603597N | Automated Test and Analysis | 04 | 22,188 | | | | | | | U |
| 57 | 0603599N | Frigate Development | 04 | 18,965 | 84,900 | 84,900 | | | | | U |
| 58 | 0603609N | Conventional Munitions | 04 | 7,676 | 8,342 | 8,342 | | | | | U |
| 59 | 0603611M | Marine Corps Assault Vehicles | 04 | 196,991 | 158,682 | 158,682 | | | | | U |
| 60 | 0603635M | Marine Corps Ground Combat/Support System | 04 | 359 | 1,303 | 1,303 | | | | | U |
| 61 | 0603654N | Joint Service Explosive Ordnance Development | 04 | 14,957 | 46,911 | 46,911 | | 3,500 | | 3,500 | U |
| 62 | 0603658N | Cooperative Engagement | 04 | 72,472 | | | | | | | U |
| 63 | 0603713N | Ocean Engineering Technology Development | 04 | 5,135 | 4,556 | 4,556 | | | | | U |

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Total Obligational Authority
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| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 0603562N | Submarine Tactical Warfare Systems | 04 | 8,782 | 8,782 | | 8,782 | 13,834 | | 13,834 | U |
| 47 | 0603563N | Ship Concept Advanced Design | 04 | 14,590 | 14,590 | | 14,590 | 36,891 | | 36,891 | U |
| 48 | 0603564N | Ship Preliminary Design & Feasibility Studies | 04 | 15,805 | 15,805 | | 15,805 | 12,012 | | 12,012 | U |
| 49 | 0603570N | Advanced Nuclear Power Systems | 04 | 453,313 | 453,313 | | 453,313 | 329,500 | | 329,500 | U |
| 50 | 0603573N | Advanced Surface Machinery Systems | 04 | 36,655 | 36,655 | | 36,655 | 29,953 | | 29,953 | U |
| 51 | 0603576N | CHALK EAGLE | 04 | 367,016 | 367,016 | | 367,016 | 191,610 | | 191,610 | U |
| 52 | 0603581N | Littoral Combat Ship (LCS) | 04 | 51,630 | 51,630 | | 51,630 | 40,991 | | 40,991 | U |
| 53 | 0603582N | Combat System Integration | 04 | 23,530 | 26,530 | | 26,530 | 24,674 | | 24,674 | U |
| 54 | 0603595N | Ohio Replacement | 04 | 700,811 | 700,811 | | 700,811 | 776,158 | | 776,158 | U |
| 55 | 0603596N | LCS Mission Modules | 04 | 160,058 | 160,058 | | 160,058 | 116,871 | | 116,871 | U |
| 56 | 0603597N | Automated Test and Analysis | 04 | | | | | 8,052 | | 8,052 | U |
| 57 | 0603599N | Frigate Development | 04 | 84,900 | 84,900 | | 84,900 | 143,450 | | 143,450 | U |
| 58 | 0603609N | Conventional Munitions | 04 | 8,342 | 8,342 | | 8,342 | 8,909 | | 8,909 | U |
| 59 | 0603611M | Marine Corps Assault Vehicles | 04 | 158,682 | 158,682 | | 158,682 | | | | U |
| 60 | 0603635M | Marine Corps Ground Combat/Support System | 04 | 1,303 | 1,303 | | 1,303 | 1,428 | | 1,428 | U |
| 61 | 0603654N | Joint Service Explosive Ordnance Development | 04 | 46,911 | 50,411 | | 50,411 | 53,367 | | 53,367 | U |
| 62 | 0603658N | Cooperative Engagement | 04 | | | | | | | | U |
| 63 | 0603713N | Ocean Engineering Technology Development | 04 | 4,556 | 4,556 | | 4,556 | 8,212 | | 8,212 | U |

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Total Obligational Authority
(Dollars in Thousands)

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| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 0603721N | Environmental Protection | 04 | 19,286 | 20,343 | 20,343 | | | | | U |
| 65 | 0603724N | Navy Energy Program | 04 | 54,911 | 52,479 | 27,479 | | | | | U |
| 66 | 0603725N | Facilities Improvement | 04 | 3,726 | 5,458 | 5,458 | | | | | U |
| 67 | 0603734N | CHALK CORAL | 04 | 168,960 | 245,860 | 245,860 | | | | | U |
| 68 | 0603739N | Navy Logistic Productivity | 04 | 3,728 | 3,089 | 3,089 | | | | | U |
| 69 | 0603746N | RETRACT MAPLE | 04 | 340,897 | 323,526 | 323,526 | | | | | U |
| 70 | 0603748N | LINK PLUMERIA | 04 | 192,336 | 318,497 | 318,497 | | | | | U |
| 71 | 0603751N | RETRACT ELM | 04 | 36,086 | 52,834 | 52,834 | | | | | U |
| 72 | 0603764N | LINK EVERGREEN | 04 | 45,603 | 48,116 | 48,116 | | | | | U |
| 73 | 0603787N | Special Processes | 04 | 16,769 | 13,619 | 13,619 | | | | | U |
| 74 | 0603790N | NATO Research and Development | 04 | 8,320 | 9,867 | 9,867 | | | | | U |
| 75 | 0603795N | Land Attack Technology | 04 | 887 | 6,015 | 6,015 | | | | | U |
| 76 | 0603851M | Joint Non-Lethal Weapons Testing | 04 | 27,976 | 27,904 | 27,904 | | | | | U |
| 77 | 0603860N | Joint Precision Approach and Landing Systems - Dem/Val | 04 | 80,313 | 104,144 | 104,144 | | | | | U |
| 78 | 0603925N | Directed Energy and Electric Weapon Systems | 04 | 41,355 | 32,700 | 32,700 | | | | | U |
| 79 | 0604112N | Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80) | 04 | 95,408 | 70,528 | 70,528 | | | | | U |
| 80 | 0604122N | Remote Minehunting System (RMS) | 04 | 16,940 | 3,001 | 3,001 | | | | | U |
| 81 | 0604272N | Tactical Air Directional Infrared Countermeasures (TADIRCM) | 04 | 18,963 | 34,920 | 34,920 | 37,990 | 37,990 | | 37,990 | U |

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Total Obligational Authority
(Dollars in Thousands)

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| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | 0603721N | Environmental Protection | 04 | 20,343 | 20,343 | | 20,343 | 20,214 | | 20,214 | U |
| 65 | 0603724N | Navy Energy Program | 04 | 52,479 | 27,479 | | 27,479 | 50,623 | | 50,623 | U |
| 66 | 0603725N | Facilities Improvement | 04 | 5,458 | 5,458 | | 5,458 | 2,837 | | 2,837 | U |
| 67 | 0603734N | CHALK CORAL | 04 | 245,860 | 245,860 | | 245,860 | 245,143 | | 245,143 | U |
| 68 | 0603739N | Navy Logistic Productivity | 04 | 3,089 | 3,089 | | 3,089 | 2,995 | | 2,995 | U |
| 69 | 0603746N | RETRACT MAPLE | 04 | 323,526 | 323,526 | | 323,526 | 306,101 | | 306,101 | U |
| 70 | 0603748N | LINK PLUMERIA | 04 | 318,497 | 318,497 | | 318,497 | 253,675 | | 253,675 | U |
| 71 | 0603751N | RETRACT ELM | 04 | 52,834 | 52,834 | | 52,834 | 55,691 | | 55,691 | U |
| 72 | 0603764N | LINK EVERGREEN | 04 | 48,116 | 48,116 | | 48,116 | 48,982 | | 48,982 | U |
| 73 | 0603787N | Special Processes | 04 | 13,619 | 13,619 | | 13,619 | | | | U |
| 74 | 0603790N | NATO Research and Development | 04 | 9,867 | 9,867 | | 9,867 | 9,099 | | 9,099 | U |
| 75 | 0603795N | Land Attack Technology | 04 | 6,015 | 6,015 | | 6,015 | 33,568 | | 33,568 | U |
| 76 | 0603851M | Joint Non-Lethal Weapons Testing | 04 | 27,904 | 27,904 | | 27,904 | 29,873 | | 29,873 | U |
| 77 | 0603860N | Joint Precision Approach and Landing Systems - Dem/Val | 04 | 104,144 | 104,144 | | 104,144 | 106,391 | | 106,391 | U |
| 78 | 0603925N | Directed Energy and Electric Weapon Systems | 04 | 32,700 | 32,700 | | 32,700 | 107,310 | | 107,310 | U |
| 79 | 0604112N | Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80) | 04 | 70,528 | 70,528 | | 70,528 | 83,935 | | 83,935 | U |
| 80 | 0604122N | Remote Minehunting System (RMS) | 04 | 3,001 | 3,001 | | 3,001 | | | | U |
| 81 | 0604272N | Tactical Air Directional Infrared Countermeasures (TADIRCM) | 04 | 72,910 | 72,910 | | 72,910 | 46,844 | 5,710 | 52,554 | U |

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Total Obligational Authority
(Dollars in Thousands)

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| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | 0604279N | ASE Self-Protection Optimization | 04 | 8,995 | | | | | | | U |
| 83 | 0604286M | Marine Corps Additive Manufacturing Technology Development | 04 | | | | | | | | U |
| 84 | 0604292N | MH-XX | 04 | 4,462 | 1,620 | 1,620 | | | | | U |
| 85 | 0604320M | Rapid Technology Capability Prototype | 04 | | | | | | | | U |
| 86 | 0604454N | LX (R) | 04 | 73,392 | 6,354 | 6,354 | | | | | U |
| 87 | 0604536N | Advanced Undersea Prototyping | 04 | | 78,589 | 78,589 | | | | | U |
| 88 | 0604653N | Joint Counter Radio Controlled IED Electronic Warfare (JCREW) | 04 | 3,765 | | | | | | | U |
| 89 | 0604659N | Precision Strike Weapons Development Program | 04 | 7,621 | 9,910 | 9,910 | | | | | U |
| 90 | 0604707N | Space and Electronic Warfare (SEW) Architecture/Engineering Support | 04 | 22,214 | 23,971 | 23,971 | | | | | U |
| 91 | 0604786N | Offensive Anti-Surface Warfare Weapon Development | 04 | 348,708 | 252,409 | 313,109 | | | | | U |
| 92 | 0605812M | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph | 04 | 24,790 | 23,197 | 23,197 | | | | | U |
| 93 | 0303354N | ASW Systems Development - MIP | 04 | 9,835 | 9,110 | 9,110 | | | | | U |
| 94 | 0304240M | Advanced Tactical Unmanned Aircraft System | 04 | | | | | | | | U |
| 95 | 0304270N | Electronic Warfare Development - MIP | 04 | 580 | 437 | 437 | | | | | U |
| | | Advanced Component Development & Prototypes | | 4,929,981 | 4,662,867 | 4,707,367 | 41,897 | 77,397 | | 77,397 | |
| 96 | 0603208N | Training System Aircraft | 05 | 16,438 | 19,938 | 19,938 | | | | | U |

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Total Obligational Authority
(Dollars in Thousands)

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | 0604279N | ASE Self-Protection Optimization | 04 | | | | | | | | U |
| 83 | 0604286M | Marine Corps Additive Manufacturing Technology Development | 04 | | | | | 6,200 | | 6,200 | U |
| 84 | 0604292N | MH-XX | 04 | 1,620 | 1,620 | | 1,620 | | | | U |
| 85 | 0604320M | Rapid Technology Capability Prototype | 04 | | | | | 7,055 | | 7,055 | U |
| 86 | 0604454N | LX (R) | 04 | 6,354 | 6,354 | | 6,354 | 9,578 | | 9,578 | U |
| 87 | 0604536N | Advanced Undersea Prototyping | 04 | 78,589 | 78,589 | | 78,589 | 66,543 | | 66,543 | U |
| 88 | 0604653N | Joint Counter Radio Controlled IED Electronic Warfare (JCREW) | 04 | | | | | | | | U |
| 89 | 0604659N | Precision Strike Weapons Development Program | 04 | 9,910 | 9,910 | | 9,910 | 31,315 | | 31,315 | U |
| 90 | 0604707N | Space and Electronic Warfare (SEW) Architecture/Engineering Support | 04 | 23,971 | 23,971 | | 23,971 | 42,851 | | 42,851 | U |
| 91 | 0604786N | Offensive Anti-Surface Warfare Weapon Development | 04 | 252,409 | 313,109 | | 313,109 | 160,694 | | 160,694 | U |
| 92 | 0605812M | Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph | 04 | 23,197 | 23,197 | | 23,197 | | | | U |
| 93 | 0303354N | ASW Systems Development - MIP | 04 | 9,110 | 9,110 | | 9,110 | 8,278 | | 8,278 | U |
| 94 | 0304240M | Advanced Tactical Unmanned Aircraft System | 04 | | | | | 7,979 | | 7,979 | U |
| 95 | 0304270N | Electronic Warfare Development - MIP | 04 | 437 | 437 | | 437 | 527 | | 527 | U |
| | | Advanced Component Development & Prototypes | | 4,704,764 | 4,784,764 | | 4,784,764 | 4,218,714 | 27,710 | 4,246,424 | |
| 96 | 0603208N | Training System Aircraft | 05 | 19,938 | 19,938 | | 19,938 | 16,945 | | 16,945 | U |

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| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 97 | 0604212N | Other Helo Development | 05 | 12,070 | 6,268 | 6,268 | | | | | U |
| 98 | 0604214N | AV-8B Aircraft - Eng Dev | 05 | 26,939 | 33,664 | 34,902 | | | | | U |
| 99 | 0604215N | Standards Development | 05 | 48,677 | 1,300 | 1,300 | | | | | U |
| 100 | 0604216N | Multi-Mission Helicopter Upgrade Development | 05 | 17,518 | 5,275 | 5,275 | | | | | U |
| 101 | 0604218N | Air/Ocean Equipment Engineering | 05 | 4,406 | 3,875 | 3,875 | | | | | U |
| 102 | 0604221N | P-3 Modernization Program | 05 | 1,485 | 1,909 | 1,909 | | | | | U |
| 103 | 0604230N | Warfare Support System | 05 | 5,740 | 13,237 | 13,237 | | | | | U |
| 104 | 0604231N | Tactical Command System | 05 | 75,508 | 36,323 | 40,323 | | | | | U |
| 105 | 0604234N | Advanced Hawkeye | 05 | 211,146 | 363,792 | 363,792 | | | | | U |
| 106 | 0604245N | H-1 Upgrades | 05 | 26,768 | 27,441 | 27,441 | | | | | U |
| 107 | 0604261N | Acoustic Search Sensors | 05 | 30,637 | 34,525 | 34,525 | | | | | U |
| 108 | 0604262N | V-22A | 05 | 74,366 | 174,423 | 189,423 | | | | | U |
| 109 | 0604264N | Air Crew Systems Development | 05 | 10,201 | 13,577 | 13,577 | | | | | U |
| 110 | 0604269N | EA-18 | 05 | 45,384 | 116,761 | 116,761 | | | | | U |
| 111 | 0604270N | Electronic Warfare Development | 05 | 22,383 | 48,766 | 92,766 | | | | | U |
| 112 | 0604273N | Executive Helo Development | 05 | 490,768 | 338,357 | 338,357 | | | | | U |
| 113 | 0604274N | Next Generation Jammer (NGJ) | 05 | 376,548 | 577,822 | 577,822 | | | | | U |
| 114 | 0604280N | Joint Tactical Radio System - Navy (JTRS-Navy) | 05 | 24,300 | 2,365 | 2,365 | | | | | U |
| 115 | 0604282N | Next Generation Jammer (NGJ) Increment II | 05 | 12,306 | 52,065 | 52,065 | | | | | U |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 97 | 0604212N | Other Helo Development | 05 | 6,268 | 6,268 | | 6,268 | 26,786 | | 26,786 | U |
| 98 | 0604214N | AV-8B Aircraft - Eng Dev | 05 | 33,664 | 34,902 | | 34,902 | 48,780 | | 48,780 | U |
| 99 | 0604215N | Standards Development | 05 | 1,300 | 1,300 | | 1,300 | 2,722 | | 2,722 | U |
| 100 | 0604216N | Multi-Mission Helicopter Upgrade Development | 05 | 5,275 | 5,275 | | 5,275 | 5,371 | | 5,371 | U |
| 101 | 0604218N | Air/Ocean Equipment Engineering | 05 | 3,875 | 3,875 | | 3,875 | 782 | | 782 | U |
| 102 | 0604221N | P-3 Modernization Program | 05 | 1,909 | 1,909 | | 1,909 | 1,361 | | 1,361 | U |
| 103 | 0604230N | Warfare Support System | 05 | 13,237 | 13,237 | | 13,237 | 14,167 | | 14,167 | U |
| 104 | 0604231N | Tactical Command System | 05 | 36,323 | 40,323 | | 40,323 | 55,695 | | 55,695 | U |
| 105 | 0604234N | Advanced Hawkeye | 05 | 363,792 | 363,792 | | 363,792 | 292,535 | | 292,535 | U |
| 106 | 0604245N | H-1 Upgrades | 05 | 27,441 | 27,441 | | 27,441 | 61,288 | | 61,288 | U |
| 107 | 0604261N | Acoustic Search Sensors | 05 | 34,525 | 34,525 | | 34,525 | 37,167 | | 37,167 | U |
| 108 | 0604262N | V-22A | 05 | 174,423 | 189,423 | | 189,423 | 171,386 | | 171,386 | U |
| 109 | 0604264N | Air Crew Systems Development | 05 | 13,577 | 13,577 | | 13,577 | 13,235 | | 13,235 | U |
| 110 | 0604269N | EA-18 | 05 | 116,761 | 116,761 | | 116,761 | 173,488 | | 173,488 | U |
| 111 | 0604270N | Electronic Warfare Development | 05 | 48,766 | 92,766 | | 92,766 | 54,055 | | 54,055 | U |
| 112 | 0604273N | Executive Helo Development | 05 | 338,357 | 338,357 | | 338,357 | 451,938 | | 451,938 | U |
| 113 | 0604274N | Next Generation Jammer (NGJ) | 05 | 577,822 | 577,822 | | 577,822 | 632,936 | | 632,936 | U |
| 114 | 0604280N | Joint Tactical Radio System - Navy (JTRS-Navy) | 05 | 2,365 | 2,365 | | 2,365 | 4,310 | | 4,310 | U |
| 115 | 0604282N | Next Generation Jammer (NGJ) Increment II | 05 | 52,065 | 52,065 | | 52,065 | 66,686 | | 66,686 | U |

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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116 | 0604307N | Surface Combatant Combat System Engineering | 05 | 430,450 | 282,764 | 282,764 | | | | | U |
| 117 | 0604311N | LPD-17 Class Systems Integration | 05 | 730 | 580 | 580 | | | | | U |
| 118 | 0604329N | Small Diameter Bomb (SDB) | 05 | 55,818 | 97,622 | 97,622 | | | | | U |
| 119 | 0604366N | Standard Missile Improvements | 05 | 111,295 | 120,561 | 120,561 | | | | | U |
| 120 | 0604373N | Airborne MCM | 05 | 9,399 | 45,622 | 45,622 | | | | | U |
| 121 | 0604376M | Marine Air Ground Task Force (MAGTF) Electronic Warfare (EW) for Aviation | 05 | 3,281 | | | | | | | U |
| 122 | 0604378N | Naval Integrated Fire Control - Counter Air Systems Engineering | 05 | 22,960 | 25,750 | 25,750 | | | | | U |
| 123 | 0604404N | Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System | 05 | 414,376 | | | | | | | U |
| 124 | 0604501N | Advanced Above Water Sensors | 05 | 42,796 | 85,868 | 85,868 | | | | | U |
| 125 | 0604503N | SSN-688 and Trident Modernization | 05 | 106,342 | 117,476 | 117,476 | | | | | U |
| 126 | 0604504N | Air Control | 05 | 55,947 | 47,404 | 47,404 | | | | | U |
| 127 | 0604512N | Shipboard Aviation Systems | 05 | 117,401 | 112,158 | 112,158 | | | | | U |
| 128 | 0604518N | Combat Information Center Conversion | 05 | | 6,283 | 6,283 | | | | | U |
| 129 | 0604522N | Air and Missile Defense Radar (AMDR) System | 05 | 227,051 | 144,395 | 144,395 | | | | | U |
| 130 | 0604558N | New Design SSN | 05 | 150,442 | 113,013 | 113,013 | | | | | U |
| 131 | 0604562N | Submarine Tactical Warfare System | 05 | 51,054 | 43,160 | 43,160 | | | | | U |
| 132 | 0604567N | Ship Contract Design/ Live Fire T&E | 05 | 38,060 | 65,002 | 63,311 | | | | | U |

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(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116 | 0604307N | Surface Combatant Combat System Engineering | 05 | 282,764 | 282,764 | | 282,764 | 390,238 | | 390,238 | U |
| 117 | 0604311N | LPD-17 Class Systems Integration | 05 | 580 | 580 | | 580 | 689 | | 689 | U |
| 118 | 0604329N | Small Diameter Bomb (SDB) | 05 | 97,622 | 97,622 | | 97,622 | 112,846 | | 112,846 | U |
| 119 | 0604366N | Standard Missile Improvements | 05 | 120,561 | 120,561 | | 120,561 | 158,578 | | 158,578 | U |
| 120 | 0604373N | Airborne MCM | 05 | 45,622 | 45,622 | | 45,622 | 15,734 | | 15,734 | U |
| 121 | 0604376M | Marine Air Ground Task Force (MAGTF) Electronic Warfare (EW) for Aviation | 05 | | | | | | | | U |
| 122 | 0604378N | Naval Integrated Fire Control - Counter Air Systems Engineering | 05 | 25,750 | 25,750 | | 25,750 | 25,445 | | 25,445 | U |
| 123 | 0604404N | Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System | 05 | | | | | | | | U |
| 124 | 0604501N | Advanced Above Water Sensors | 05 | 85,868 | 85,868 | | 85,868 | 87,233 | | 87,233 | U |
| 125 | 0604503N | SSN-688 and Trident Modernization | 05 | 117,476 | 117,476 | | 117,476 | 130,981 | | 130,981 | U |
| 126 | 0604504N | Air Control | 05 | 47,404 | 47,404 | | 47,404 | 75,186 | | 75,186 | U |
| 127 | 0604512N | Shipboard Aviation Systems | 05 | 112,158 | 112,158 | | 112,158 | 177,926 | | 177,926 | U |
| 128 | 0604518N | Combat Information Center Conversion | 05 | 6,283 | 6,283 | | 6,283 | 8,062 | | 8,062 | U |
| 129 | 0604522N | Air and Missile Defense Radar (AMDR) System | 05 | 144,395 | 144,395 | | 144,395 | 32,090 | | 32,090 | U |
| 130 | 0604558N | New Design SSN | 05 | 113,013 | 113,013 | | 113,013 | 120,087 | | 120,087 | U |
| 131 | 0604562N | Submarine Tactical Warfare System | 05 | 43,160 | 43,160 | | 43,160 | 50,850 | | 50,850 | U |
| 132 | 0604567N | Ship Contract Design/ Live Fire T&E | 05 | 65,002 | 63,311 | | 63,311 | 67,166 | | 67,166 | U |

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| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 133 | 0604574N | Navy Tactical Computer Resources | 05 | 4,053 | 3,098 | 3,098 | | | | | U |
| 134 | 0604580N | Virginia Payload Module (VPM) | 05 | 162,168 | 97,920 | 97,920 | | | | | U |
| 135 | 0604601N | Mine Development | 05 | 12,602 | 10,490 | 15,290 | | | | | U |
| 136 | 0604610N | Lightweight Torpedo Development | 05 | 42,548 | 20,178 | 20,178 | | | | | U |
| 137 | 0604654N | Joint Service Explosive Ordnance Development | 05 | 8,123 | 7,369 | 7,369 | | | | | U |
| 138 | 0604703N | Personnel, Training, Simulation, and Human Factors | 05 | 7,408 | 4,995 | 18,995 | | | | | U |
| 139 | 0604727N | Joint Standoff Weapon Systems | 05 | 394 | 412 | 412 | | | | | U |
| 140 | 0604755N | Ship Self Defense (Detect & Control) | 05 | 145,229 | 134,619 | 134,619 | | | | | U |
| 141 | 0604756N | Ship Self Defense (Engage: Hard Kill) | 05 | 93,481 | 114,475 | 114,475 | | | | | U |
| 142 | 0604757N | Ship Self Defense (Engage: Soft Kill/EW) | 05 | 100,153 | 114,211 | 114,211 | | | | | U |
| 143 | 0604761N | Intelligence Engineering | 05 | 2,053 | 11,029 | 13,029 | | | | | U |
| 144 | 0604771N | Medical Development | 05 | 24,658 | 9,220 | 9,221 | | | | | U |
| 145 | 0604777N | Navigation/ID System | 05 | 32,339 | 42,723 | 42,723 | | | | | U |
| 146 | 0604800M | Joint Strike Fighter (JSF) - EMD | 05 | 526,247 | 531,426 | 531,426 | | | | | U |
| 147 | 0604800N | Joint Strike Fighter (JSF) - EMD | 05 | 488,703 | 528,716 | 528,716 | | | | | U |
| 148 | 0604810M | Joint Strike Fighter Follow On Modernization (FoM) - Marine Corps | 05 | 20,157 | 74,227 | 74,227 | | | | | U |
| 149 | 0604810N | Joint Strike Fighter Follow On Modernization (FoM) - Navy | 05 | 20,544 | 63,387 | 63,387 | | | | | U |

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Total Obligational Authority
(Dollars in Thousands)

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| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 133 | 0604574N | Navy Tactical Computer Resources | 05 | 3,098 | 3,098 | | 3,098 | 4,817 | | 4,817 | U |
| 134 | 0604580N | Virginia Payload Module (VPM) | 05 | 97,920 | 97,920 | | 97,920 | 72,861 | | 72,861 | U |
| 135 | 0604601N | Mine Development | 05 | 10,490 | 15,290 | | 15,290 | 25,635 | | 25,635 | U |
| 136 | 0604610N | Lightweight Torpedo Development | 05 | 20,178 | 20,178 | | 20,178 | 28,076 | | 28,076 | U |
| 137 | 0604654N | Joint Service Explosive Ordnance Development | 05 | 7,369 | 7,369 | | 7,369 | 7,561 | | 7,561 | U |
| 138 | 0604703N | Personnel, Training, Simulation, and Human Factors | 05 | 4,995 | 18,995 | | 18,995 | 40,828 | | 40,828 | U |
| 139 | 0604727N | Joint Standoff Weapon Systems | 05 | 412 | 412 | | 412 | 435 | | 435 | U |
| 140 | 0604755N | Ship Self Defense (Detect & Control) | 05 | 134,619 | 134,619 | | 134,619 | 161,713 | | 161,713 | U |
| 141 | 0604756N | Ship Self Defense (Engage: Hard Kill) | 05 | 114,475 | 114,475 | | 114,475 | 212,412 | | 212,412 | U |
| 142 | 0604757N | Ship Self Defense (Engage: Soft Kill/EW) | 05 | 114,211 | 114,211 | | 114,211 | 103,391 | | 103,391 | U |
| 143 | 0604761N | Intelligence Engineering | 05 | 11,029 | 13,029 | | 13,029 | 34,855 | | 34,855 | U |
| 144 | 0604771N | Medical Development | 05 | 9,220 | 9,221 | | 9,221 | 9,353 | | 9,353 | U |
| 145 | 0604777N | Navigation/ID System | 05 | 42,723 | 42,723 | | 42,723 | 92,546 | | 92,546 | U |
| 146 | 0604800M | Joint Strike Fighter (JSF) - EMD | 05 | 531,426 | 531,426 | | 531,426 | 152,934 | | 152,934 | U |
| 147 | 0604800N | Joint Strike Fighter (JSF) - EMD | 05 | 528,716 | 528,716 | | 528,716 | 108,931 | | 108,931 | U |
| 148 | 0604810M | Joint Strike Fighter Follow On Modernization (FoM) - Marine Corps | 05 | 74,227 | 74,227 | | 74,227 | 144,958 | | 144,958 | U |
| 149 | 0604810N | Joint Strike Fighter Follow On Modernization (FoM) - Navy | 05 | 63,387 | 63,387 | | 63,387 | 143,855 | | 143,855 | U |

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(Dollars in Thousands)

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 | 0605013M | Information Technology Development | 05 | 3,915 | 4,856 | 4,856 | | | | | U |
| 151 | 0605013N | Information Technology Development | 05 | 77,895 | 97,066 | 97,066 | | | | | U |
| 152 | 0605024N | Anti-Tamper Technology Support | 05 | | 2,500 | 2,500 | | | | | U |
| 153 | 0605212N | CH-53K RDTE | 05 | 563,174 | 404,810 | 404,810 | | | | | U |
| 154 | 0605215N | Mission Planning | 05 | | 33,570 | 33,570 | | | | | U |
| 155 | 0605217N | Common Avionics | 05 | | 51,599 | 54,599 | | | | | U |
| 156 | 0605220N | Ship to Shore Connector (SSC) | 05 | 7,734 | 11,088 | 11,088 | | | | | U |
| 157 | 0605327N | T-AO 205 Class | 05 | | 1,095 | 1,095 | | | | | U |
| 158 | 0605414N | Unmanned Carrier Aviation (UCA) | 05 | | 89,000 | 89,000 | | | | | U |
| 159 | 0605450N | Joint Air-to-Ground Missile (JAGM) | 05 | 25,640 | 17,880 | 17,880 | | | | | U |
| 160 | 0605500N | Multi-mission Maritime Aircraft (MMA) | 05 | 151,472 | 59,126 | 59,126 | | | | | U |
| 161 | 0605504N | Multi-Mission Maritime (MMA) Increment III | 05 | 89,686 | 182,220 | 182,220 | | | | | U |
| 162 | 0605611M | Marine Corps Assault Vehicles System Development & Demonstration | 05 | | | | | | | | U |
| 163 | 0605813M | Joint Light Tactical Vehicle (JLTV) System Development & Demonstration | 05 | | | | | | | | U |
| 164 | 0204202N | DDG-1000 | 05 | 101,724 | 45,642 | 45,642 | | | | | U |
| 165 | 0303167N | Pre-Auction Spectrum Relocation*** | 05 | 131 | | | | | | | U |
| 166 | 0303267N | Auctioned Spectrum Relocation Fund*** | 05 | 108,490 | | | | | | | U |
| 167 | 0304231N | Tactical Command System - MIP | 05 | 998 | 676 | 676 | | | | | U |

***Funding in this line item was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 | 0605013M | Information Technology Development | 05 | 4,856 | 4,856 | | 4,856 | 14,865 | | 14,865 | U |
| 151 | 0605013N | Information Technology Development | 05 | 97,066 | 97,066 | | 97,066 | 152,977 | | 152,977 | U |
| 152 | 0605024N | Anti-Tamper Technology Support | 05 | 2,500 | 2,500 | | 2,500 | 3,410 | | 3,410 | U |
| 153 | 0605212N | CH-53K RDTE | 05 | 404,810 | 404,810 | | 404,810 | 340,758 | | 340,758 | U |
| 154 | 0605215N | Mission Planning | 05 | 33,570 | 33,570 | | 33,570 | 33,430 | | 33,430 | U |
| 155 | 0605217N | Common Avionics | 05 | 51,599 | 54,599 | | 54,599 | 58,163 | | 58,163 | U |
| 156 | 0605220N | Ship to Shore Connector (SSC) | 05 | 11,088 | 11,088 | | 11,088 | 22,410 | | 22,410 | U |
| 157 | 0605327N | T-AO 205 Class | 05 | 1,095 | 1,095 | | 1,095 | 1,961 | | 1,961 | U |
| 158 | 0605414N | Unmanned Carrier Aviation (UCA) | 05 | 89,000 | 89,000 | | 89,000 | 222,208 | | 222,208 | U |
| 159 | 0605450N | Joint Air-to-Ground Missile (JAGM) | 05 | 17,880 | 17,880 | | 17,880 | 15,473 | | 15,473 | U |
| 160 | 0605500N | Multi-mission Maritime Aircraft (MMA) | 05 | 59,126 | 59,126 | | 59,126 | 11,795 | | 11,795 | U |
| 161 | 0605504N | Multi-Mission Maritime (MMA) Increment III | 05 | 182,220 | 182,220 | | 182,220 | 181,731 | | 181,731 | U |
| 162 | 0605611M | Marine Corps Assault Vehicles System Development & Demonstration | 05 | | | | | 178,993 | | 178,993 | U |
| 163 | 0605813M | Joint Light Tactical Vehicle (JLTV) System Development & Demonstration | 05 | | | | | 20,710 | | 20,710 | U |
| 164 | 0204202N | DDG-1000 | 05 | 45,642 | 45,642 | | 45,642 | 140,500 | | 140,500 | U |
| 165 | 0303167N | Pre-Auction Spectrum Relocation*** | 05 | | | | | | | | U |
| 166 | 0303267N | Auctioned Spectrum Relocation Fund*** | 05 | | | | | | | | U |
| 167 | 0304231N | Tactical Command System - MIP | 05 | 676 | 676 | | 676 | | | | U |

***Funding in this line item was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

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| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 168 | 0304785N | Tactical Cryptologic Systems | 05 | 17,785 | 36,747 | 36,747 | | | | | U |
| 169 | 0305124N | Special Applications Program | 05 | 26,505 | 35,002 | 35,002 | | | | | U |
| 170 | 0306250M | Cyber Operations Technology Development | 05 | | 4,942 | 4,942 | | | | | U |
| | | System Development & Demonstration | | 6,236,999 | 6,025,655 | 6,112,003 | | | | | |
| 171 | 0604256N | Threat Simulator Development | 06 | 30,323 | 16,633 | 16,633 | | | | | U |
| 172 | 0604258N | Target Systems Development | 06 | 58,730 | 36,662 | 36,662 | | | | | U |
| 173 | 0604759N | Major T&E Investment | 06 | 66,538 | 42,109 | 42,109 | | | | | U |
| 174 | 0605126N | Joint Theater Air and Missile Defense Organization | 06 | 6,799 | 2,998 | 2,998 | | | | | U |
| 175 | 0605152N | Studies and Analysis Support - Navy | 06 | 4,141 | 3,931 | 3,931 | | | | | U |
| 176 | 0605154N | Center for Naval Analyses | 06 | 45,558 | 46,634 | 46,634 | | | | | U |
| 177 | 0605285N | Next Generation Fighter | 06 | 5,909 | 1,200 | 1,200 | | | | | U |
| 178 | 0605502N | Small Business Innovative Research | 06 | 384,569 | | | | | | | U |
| 179 | 0605804N | Technical Information Services | 06 | 1,328 | 903 | 903 | | | | | U |
| 180 | 0605853N | Management, Technical & International Support | 06 | 77,073 | 87,077 | 87,077 | | | | | U |
| 181 | 0605856N | Strategic Technical Support | 06 | 3,140 | 3,597 | 3,597 | | | | | U |
| 182 | 0605861N | RDT&E Science and Technology Management | 06 | 76,872 | 62,811 | 63,000 | | | | | U |
| 183 | 0605863N | RDT&E Ship and Aircraft Support | 06 | 128,715 | 106,093 | 106,093 | | | | | U |
| 184 | 0605864N | Test and Evaluation Support | 06 | 351,469 | 349,146 | 413,446 | | | | | U |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 168 | 0304785N | Tactical Cryptologic Systems | 05 | 36,747 | 36,747 | | 36,747 | 28,311 | | 28,311 | U |
| 169 | 0305124N | Special Applications Program | 05 | 35,002 | 35,002 | | 35,002 | | | | U |
| 170 | 0306250M | Cyber Operations Technology Development | 05 | 4,942 | 4,942 | | 4,942 | 4,502 | | 4,502 | U |
| | | System Development & Demonstration | | 6,025,655 | 6,112,003 | | 6,112,003 | 6,362,102 | | 6,362,102 | |
| 171 | 0604256N | Threat Simulator Development | 06 | 16,633 | 16,633 | | 16,633 | 91,819 | | 91,819 | U |
| 172 | 0604258N | Target Systems Development | 06 | 36,662 | 36,662 | | 36,662 | 23,053 | | 23,053 | U |
| 173 | 0604759N | Major T&E Investment | 06 | 42,109 | 42,109 | | 42,109 | 52,634 | | 52,634 | U |
| 174 | 0605126N | Joint Theater Air and Missile Defense Organization | 06 | 2,998 | 2,998 | | 2,998 | 141 | | 141 | U |
| 175 | 0605152N | Studies and Analysis Support - Navy | 06 | 3,931 | 3,931 | | 3,931 | 3,917 | | 3,917 | U |
| 176 | 0605154N | Center for Naval Analyses | 06 | 46,634 | 46,634 | | 46,634 | 50,432 | | 50,432 | U |
| 177 | 0605285N | Next Generation Fighter | 06 | 1,200 | 1,200 | | 1,200 | | | | U |
| 178 | 0605502N | Small Business Innovative Research | 06 | | | | | | | | U |
| 179 | 0605804N | Technical Information Services | 06 | 903 | 903 | | 903 | 782 | | 782 | U |
| 180 | 0605853N | Management, Technical & International Support | 06 | 87,077 | 87,077 | | 87,077 | 94,562 | | 94,562 | U |
| 181 | 0605856N | Strategic Technical Support | 06 | 3,597 | 3,597 | | 3,597 | 4,313 | | 4,313 | U |
| 182 | 0605861N | RDT&E Science and Technology Management | 06 | 62,811 | 63,000 | | 63,000 | 1,104 | | 1,104 | U |
| 183 | 0605863N | RDT&E Ship and Aircraft Support | 06 | 106,093 | 106,093 | | 106,093 | 105,666 | | 105,666 | U |
| 184 | 0605864N | Test and Evaluation Support | 06 | 349,146 | 413,446 | | 413,446 | 373,667 | | 373,667 | U |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 185 | 0605865N | Operational Test and Evaluation Capability | 06 | 17,796 | 18,160 | 18,199 | | | | | U |
| 186 | 0605866N | Navy Space and Electronic Warfare (SEW) Support | 06 | 6,316 | 9,658 | 9,658 | | | | | U |
| 187 | 0605867N | SEW Surveillance/Reconnaissance Support | 06 | 6,519 | 6,500 | 6,500 | | | | | U |
| 188 | 0605873M | Marine Corps Program Wide Support | 06 | 14,129 | 22,247 | 22,247 | | | | | U |
| 189 | 0605898N | Management HQ - R&D | 06 | | 16,254 | 16,312 | | | | | U |
| 190 | 0606355N | Warfare Innovation Management | 06 | | 21,123 | 21,123 | | | | | U |
| 191 | 0902498N | Management Headquarters (Departmental Support Activities) | 06 | | | | | | | | U |
| 192 | 0909980N | Judgment Fund Reimbursement | 06 | 398 | | | | | | | U |
| 193 | 0909999N | Financing for Cancelled Account Adjustments | 06 | 171 | | | | | | | U |
| 194 | 1206867N | SEW Surveillance/Reconnaissance Support | 06 | | | | | | | | U |
| | | Management Support | | 1,286,493 | 853,736 | 918,322 | | | | | |
| 196 | 0607658N | Cooperative Engagement Capability (CEC) | 07 | | 84,501 | 84,501 | | | | | U |
| 197 | 0607700N | Deployable Joint Command and Control | 07 | | 2,970 | 2,970 | | | | | U |
| 198 | 0101221N | Strategic Sub & Weapons System Support | 07 | 96,078 | 136,556 | 136,556 | | | | | U |
| 199 | 0101224N | SSBN Security Technology Program | 07 | 45,166 | 33,845 | 33,845 | | | | | U |
| 200 | 0101226N | Submarine Acoustic Warfare Development | 07 | 4,658 | 9,329 | 9,329 | | | | | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 185 | 0605865N | Operational Test and Evaluation Capability | 06 | 18,160 | 18,199 | | 18,199 | 20,298 | | 20,298 | U |
| 186 | 0605866N | Navy Space and Electronic Warfare (SEW) Support | 06 | 9,658 | 9,658 | | 9,658 | 17,341 | | 17,341 | U |
| 187 | 0605867N | SEW Surveillance/Reconnaissance Support | 06 | 6,500 | 6,500 | | 6,500 | | | | U |
| 188 | 0605873M | Marine Corps Program Wide Support | 06 | 22,247 | 22,247 | | 22,247 | 21,751 | | 21,751 | U |
| 189 | 0605898N | Management HQ - R&D | 06 | 16,254 | 16,312 | | 16,312 | 44,279 | | 44,279 | U |
| 190 | 0606355N | Warfare Innovation Management | 06 | 21,123 | 21,123 | | 21,123 | 28,841 | | 28,841 | U |
| 191 | 0902498N | Management Headquarters (Departmental Support Activities) | 06 | | | | | 1,749 | | 1,749 | U |
| 192 | 0909980N | Judgment Fund Reimbursement | 06 | | | | | | | | U |
| 193 | 0909999N | Financing for Cancelled Account Adjustments | 06 | | | | | | | | U |
| 194 | 1206867N | SEW Surveillance/Reconnaissance Support | 06 | | | | | 9,408 | | 9,408 | U |
| | | Management Support | | 853,736 | 918,322 | | 918,322 | 945,757 | | 945,757 | |
| 196 | 0607658N | Cooperative Engagement Capability (CEC) | 07 | 84,501 | 84,501 | | 84,501 | 92,571 | | 92,571 | U |
| 197 | 0607700N | Deployable Joint Command and Control | 07 | 2,970 | 2,970 | | 2,970 | 3,137 | | 3,137 | U |
| 198 | 0101221N | Strategic Sub & Weapons System Support | 07 | 136,556 | 136,556 | | 136,556 | 135,219 | | 135,219 | U |
| 199 | 0101224N | SSBN Security Technology Program | 07 | 33,845 | 33,845 | | 33,845 | 36,242 | | 36,242 | U |
| 200 | 0101226N | Submarine Acoustic Warfare Development | 07 | 9,329 | 9,329 | | 9,329 | 12,053 | | 12,053 | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | 0101402N | Navy Strategic Communications | 07 | 16,121 | 17,218 | 17,218 | | | | | U |
| 202 | 0203761N | Rapid Technology Transition (RTT) | 07 | 7,626 | | | | | | | U |
| 203 | 0204136N | F/A-18 Squadrons | 07 | 132,905 | 189,125 | 189,125 | | | | | U |
| 204 | 0204163N | Fleet Telecommunications (Tactical) | 07 | 39,548 | 48,225 | 48,225 | | | | | U |
| 205 | 0204228N | Surface Support | 07 | 28,210 | 21,156 | 21,156 | | | | | U |
| 206 | 0204229N | Tomahawk and Tomahawk Mission Planning Center (TMPC) | 07 | 26,650 | 71,355 | 91,355 | | | | | U |
| 207 | 0204311N | Integrated Surveillance System | 07 | 76,204 | 58,542 | 58,542 | | | | | U |
| 208 | 0204413N | Amphibious Tactical Support Units (Displacement Craft) | 07 | 11,330 | 13,929 | 13,929 | | | | | U |
| 209 | 0204460M | Ground/Air Task Oriented Radar (G/ ATOR) | 07 | 61,348 | 83,538 | 83,538 | | | | | U |
| 210 | 0204571N | Consolidated Training Systems Development | 07 | 32,902 | 38,593 | 38,593 | | | | | U |
| 211 | 0204574N | Cryptologic Direct Support | 07 | 1,915 | 1,122 | 1,122 | | | | | U |
| 212 | 0204575N | Electronic Warfare (EW) Readiness Support | 07 | 44,727 | 99,998 | 99,998 | | | | | U |
| 213 | 0205601N | HARM Improvement | 07 | 28,063 | 48,635 | 48,635 | | | | | U |
| 214 | 0205604N | Tactical Data Links | 07 | 138,549 | 124,785 | 124,785 | | | | | U |
| 215 | 0205620N | Surface ASW Combat System Integration | 07 | 23,685 | 24,583 | 24,583 | | | | | U |
| 216 | 0205632N | MK-48 ADCAP | 07 | 47,496 | 39,134 | 39,134 | | | | | U |
| 217 | 0205633N | Aviation Improvements | 07 | 103,685 | 120,861 | 120,861 | | | | | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | 0101402N | Navy Strategic Communications | 07 | 17,218 | 17,218 | | 17,218 | 18,221 | | 18,221 | U |
| 202 | 0203761N | Rapid Technology Transition (RTT) | 07 | | | | | | | | U |
| 203 | 0204136N | F/A-18 Squadrons | 07 | 189,125 | 189,125 | | 189,125 | 224,470 | | 224,470 | U |
| 204 | 0204163N | Fleet Telecommunications (Tactical) | 07 | 48,225 | 48,225 | | 48,225 | 33,525 | | 33,525 | U |
| 205 | 0204228N | Surface Support | 07 | 21,156 | 21,156 | | 21,156 | 24,829 | | 24,829 | U |
| 206 | 0204229N | Tomahawk and Tomahawk Mission Planning Center (TMPC) | 07 | 71,355 | 91,355 | | 91,355 | 133,617 | | 133,617 | U |
| 207 | 0204311N | Integrated Surveillance System | 07 | 58,542 | 58,542 | | 58,542 | 38,972 | 11,600 | 50,572 | U |
| 208 | 0204413N | Amphibious Tactical Support Units (Displacement Craft) | 07 | 13,929 | 13,929 | | 13,929 | 3,940 | | 3,940 | U |
| 209 | 0204460M | Ground/Air Task Oriented Radar (G/ ATOR) | 07 | 83,538 | 83,538 | | 83,538 | 54,645 | | 54,645 | U |
| 210 | 0204571N | Consolidated Training Systems Development | 07 | 38,593 | 38,593 | | 38,593 | 66,518 | | 66,518 | U |
| 211 | 0204574N | Cryptologic Direct Support | 07 | 1,122 | 1,122 | | 1,122 | 1,155 | 1,200 | 2,355 | U |
| 212 | 0204575N | Electronic Warfare (EW) Readiness Support | 07 | 99,998 | 99,998 | | 99,998 | 51,040 | | 51,040 | U |
| 213 | 0205601N | HARM Improvement | 07 | 48,635 | 48,635 | | 48,635 | 87,989 | | 87,989 | U |
| 214 | 0205604N | Tactical Data Links | 07 | 124,785 | 124,785 | | 124,785 | 89,852 | | 89,852 | U |
| 215 | 0205620N | Surface ASW Combat System Integration | 07 | 24,583 | 24,583 | | 24,583 | 29,351 | | 29,351 | U |
| 216 | 0205632N | MK-48 ADCAP | 07 | 39,134 | 39,134 | | 39,134 | 68,553 | | 68,553 | U |
| 217 | 0205633N | Aviation Improvements | 07 | 120,861 | 120,861 | | 120,861 | 119,099 | | 119,099 | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 218 | 0205675N | Operational Nuclear Power Systems | 07 | 101,323 | 101,786 | 101,786 | | | | | U |
| 219 | 0206313M | Marine Corps Communications Systems | 07 | 84,017 | 82,159 | 118,146 | | | | | U |
| 220 | 0206335M | Common Aviation Command and Control System (CAC2S) | 07 | 13,959 | 11,850 | 11,850 | | | | | U |
| 221 | 0206623M | Marine Corps Ground Combat/ Supporting Arms Systems | 07 | 55,058 | 47,877 | 51,835 | | | | | U |
| 222 | 0206624M | Marine Corps Combat Services Support | 07 | 23,423 | 13,194 | 13,194 | | | | | U |
| 223 | 0206625M | USMC Intelligence/Electronic Warfare Systems (MIP) | 07 | 13,373 | 17,171 | 24,187 | | | | | U |
| 224 | 0206629M | Amphibious Assault Vehicle | 07 | 41,363 | 38,020 | 38,020 | | | | | U |
| 225 | 0207161N | Tactical AIM Missiles | 07 | 59,053 | 56,285 | 56,285 | | | | | U |
| 226 | 0207163N | Advanced Medium Range Air-to-Air Missile (AMRAAM) | 07 | 30,240 | 40,350 | 40,350 | | | | | U |
| 227 | 0219902M | Global Combat Support System - Marine Corps (GCSS-MC) | 07 | | 9,128 | 9,128 | | | | | U |
| 231 | 0303109N | Satellite Communications (SPACE) | 07 | 45,946 | 37,372 | 37,372 | | | | | U |
| 232 | 0303138N | Consolidated Afloat Network Enterprise Services (CANES) | 07 | 21,522 | 23,541 | 23,541 | | | | | U |
| 233 | 0303140N | Information Systems Security Program | 07 | 29,491 | 38,510 | 38,510 | | | | | U |
| 235 | 0305160N | Navy Meteorological and Ocean Sensors-Space (METOC) | 07 | 599 | | | | | | | U |
| 236 | 0305192N | Military Intelligence Program (MIP) Activities | 07 | 6,207 | 6,019 | 6,019 | | | | | U |
| 237 | 0305204N | Tactical Unmanned Aerial Vehicles | 07 | 8,550 | 8,436 | 8,436 | | | | | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 218 | 0205675N | Operational Nuclear Power Systems | 07 | 101,786 | 101,786 | | 101,786 | 127,445 | | 127,445 | U |
| 219 | 0206313M | Marine Corps Communications Systems | 07 | 82,159 | 118,146 | | 118,146 | 123,825 | | 123,825 | U |
| 220 | 0206335M | Common Aviation Command and Control System (CAC2S) | 07 | 11,850 | 11,850 | | 11,850 | 7,343 | | 7,343 | U |
| 221 | 0206623M | Marine Corps Ground Combat/ Supporting Arms Systems | 07 | 47,877 | 51,835 | | 51,835 | 66,009 | | 66,009 | U |
| 222 | 0206624M | Marine Corps Combat Services Support | 07 | 13,194 | 13,194 | | 13,194 | 25,258 | | 25,258 | U |
| 223 | 0206625M | USMC Intelligence/Electronic Warfare Systems (MIP) | 07 | 17,171 | 24,187 | | 24,187 | 30,886 | | 30,886 | U |
| 224 | 0206629M | Amphibious Assault Vehicle | 07 | 38,020 | 38,020 | | 38,020 | 58,728 | | 58,728 | U |
| 225 | 0207161N | Tactical AIM Missiles | 07 | 56,285 | 56,285 | | 56,285 | 42,884 | | 42,884 | U |
| 226 | 0207163N | Advanced Medium Range Air-to-Air Missile (AMRAAM) | 07 | 40,350 | 40,350 | | 40,350 | 25,364 | | 25,364 | U |
| 227 | 0219902M | Global Combat Support System - Marine Corps (GCSS-MC) | 07 | 9,128 | 9,128 | | 9,128 | | | | U |
| 231 | 0303109N | Satellite Communications (SPACE) | 07 | 37,372 | 37,372 | | 37,372 | | | | U |
| 232 | 0303138N | Consolidated Afloat Network Enterprise Services (CANES) | 07 | 23,541 | 23,541 | | 23,541 | 24,271 | | 24,271 | U |
| 233 | 0303140N | Information Systems Security Program | 07 | 38,510 | 38,510 | | 38,510 | 50,269 | | 50,269 | U |
| 235 | 0305160N | Navy Meteorological and Ocean Sensors-Space (METOC) | 07 | | | | | | | | U |
| 236 | 0305192N | Military Intelligence Program (MIP) Activities | 07 | 6,019 | 6,019 | | 6,019 | 6,352 | | 6,352 | U |
| 237 | 0305204N | Tactical Unmanned Aerial Vehicles | 07 | 8,436 | 8,436 | | 8,436 | 7,770 | | 7,770 | U |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 238 | 0305205N | UAS Integration and Interoperability | 07 | 42,202 | 36,509 | 36,509 | | | | | U |
| 239 | 0305208M | Distributed Common Ground/Surface Systems | 07 | 1,105 | 2,100 | 2,100 | | | | | U |
| 240 | 0305208N | Distributed Common Ground/Surface Systems | 07 | 23,149 | 44,571 | 44,571 | | | | | U |
| 241 | 0305220N | MQ-4C Triton | 07 | 237,118 | 111,729 | 111,729 | | | | | U |
| 242 | 0305231N | MQ-8 UAV | 07 | 52,770 | 26,518 | 26,518 | | | | | U |
| 243 | 0305232M | RQ-11 UAV | 07 | 635 | 418 | 418 | | | | | U |
| 244 | 0305233N | RQ-7 UAV | 07 | 688 | 716 | 716 | | | | | U |
| 245 | 0305234N | Small (Level 0) Tactical UAS (STUASL0) | 07 | 4,647 | 5,071 | 5,071 | | | | | U |
| 246 | 0305239M | RQ-21A | 07 | 6,251 | 9,497 | 9,497 | | | | | U |
| 247 | 0305241N | Multi-Intelligence Sensor Development | 07 | 39,645 | 77,965 | 77,965 | | | | | U |
| 248 | 0305242M | Unmanned Aerial Systems (UAS) Payloads (MIP) | 07 | 9,246 | 11,181 | 11,181 | | | | | U |
| 249 | 0305421N | RQ-4 Modernization | 07 | 119,892 | 181,266 | 181,266 | | | | | U |
| 250 | 0308601N | Modeling and Simulation Support | 07 | 4,585 | 4,709 | 4,709 | | | | | U |
| 251 | 0702207N | Depot Maintenance (Non-IF) | 07 | 23,401 | 49,322 | 49,322 | | | | | U |
| 252 | 0708730N | Maritime Technology (MARITECH) | 07 | 4,162 | 3,204 | 3,204 | | | | | U |
| 253 | 1203109N | Satellite Communications (SPACE) | 07 | | | | | | | | U |
| 9999 | 9999999999 | Classified Programs | | 1,527,932 | 1,228,460 | 1,265,631 | 36,426 | 128,626 | | 128,626 | U |
| | | Operational Systems Development | | 3,598,418 | 3,592,934 | 3,697,066 | | | | | |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 238 | 0305205N | UAS Integration and Interoperability | 07 | 36,509 | 36,509 | | 36,509 | 39,736 | | 39,736 | U |
| 239 | 0305208M | Distributed Common Ground/Surface Systems | 07 | 2,100 | 2,100 | | 2,100 | 12,867 | | 12,867 | U |
| 240 | 0305208N | Distributed Common Ground/Surface Systems | 07 | 44,571 | 44,571 | | 44,571 | 46,150 | | 46,150 | U |
| 241 | 0305220N | MQ-4C Triton | 07 | 111,729 | 111,729 | | 111,729 | 84,115 | | 84,115 | U |
| 242 | 0305231N | MQ-8 UAV | 07 | 26,518 | 26,518 | | 26,518 | 62,656 | | 62,656 | U |
| 243 | 0305232M | RQ-11 UAV | 07 | 418 | 418 | | 418 | 2,022 | | 2,022 | U |
| 244 | 0305233N | RQ-7 UAV | 07 | 716 | 716 | | 716 | | | | U |
| 245 | 0305234N | Small (Level 0) Tactical UAS (STUASL0) | 07 | 5,071 | 5,071 | | 5,071 | 4,835 | | 4,835 | U |
| 246 | 0305239M | RQ-21A | 07 | 9,497 | 9,497 | | 9,497 | 8,899 | | 8,899 | U |
| 247 | 0305241N | Multi-Intelligence Sensor Development | 07 | 77,965 | 77,965 | | 77,965 | 99,020 | | 99,020 | U |
| 248 | 0305242M | Unmanned Aerial Systems (UAS) Payloads (MIP) | 07 | 11,181 | 11,181 | | 11,181 | 18,578 | | 18,578 | U |
| 249 | 0305421N | RQ-4 Modernization | 07 | 181,266 | 181,266 | | 181,266 | 229,404 | | 229,404 | U |
| 250 | 0308601N | Modeling and Simulation Support | 07 | 4,709 | 4,709 | | 4,709 | 5,238 | | 5,238 | U |
| 251 | 0702207N | Depot Maintenance (Non-IF) | 07 | 49,322 | 49,322 | | 49,322 | 38,227 | | 38,227 | U |
| 252 | 0708730N | Maritime Technology (MARITECH) | 07 | 3,204 | 3,204 | | 3,204 | 4,808 | | 4,808 | U |
| 253 | 1203109N | Satellite Communications (SPACE) | 07 | | | | | 37,836 | | 37,836 | U |
| 9999 | 9999999999 | Classified Programs | | 1,264,886 | 1,394,257 | | 1,394,257 | 1,364,347 | 89,855 | 1,454,202 | U |
| | | Operational Systems Development | | 3,629,360 | 3,825,692 | | 3,825,692 | 3,980,140 | 102,655 | 4,082,795 | |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 254 | 0901560N | Continuing Resolution Programs | 20 | | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 | U |
| | | Undistributed | | | 800,517 | 800,517 | -42,576 | -42,576 | | -42,576 | |
| Total Research, Development, Test & Eval, Navy | | | | 18,333,041 | 18,076,818 | 18,376,384 | 35,747 | 163,447 | | 163,447 | |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 254 | 0901560N | Continuing Resolution Programs | 20 | 757,941 | 757,941 | | 757,941 | | | | U |
| | | Undistributed | | 757,941 | 757,941 | | 757,941 | | | | |
| Total Research, Development, Test & Eval, Navy | | | | 18,112,565 | 18,539,831 | | 18,539,831 | 17,675,035 | 130,365 | 17,805,400 | |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Non RDT&E Title
(Dollars in Thousands)

| Summary Recap of Budget Activities | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO |
|---|---|---|---|---|---|---|---|
| Research and Development | 36,289 | | | | | | |
| Total Research, Development, Test & Evaluation | 36,289 | | | | | | |

Summary Recap of Non-RDT&E Title FYDP Programs

| | |
|---|---|
| Mobility Forces | 36,289 |
| Total Research, Development, Test & Evaluation | 36,289 |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Non RDT&E Title
(Dollars in Thousands)

| Summary Recap of Budget Activities | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|---|---|
| Research and Development | | | | | 18,622 | | 18,622 |
| Total Research, Development, Test & Evaluation | | | | | 18,622 | | 18,622 |

Summary Recap of Non-RDT&E Title FYDP Programs

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mobility Forces | | | | | 18,622 | | 18,622 |
| Total Research, Development, Test & Evaluation | | | | | 18,622 | | 18,622 |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Non RDT&E Title
(Dollars in Thousands)

Appropriation: 4557N National Defense Sealift Fund

| Line No | Program Element Number | Item | Act | FY 2016 Base + OCO | FY 2017 PB Request with CR Adj Base | FY 2017 Total PB Requests* with CR Adj Base | FY 2017 PB Request with CR Adj OCO | FY 2017 Total PB Requests* with CR Adj OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj OCO | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0408042N | National Defense Sealift Fund | 04 | 36,289 | | | | | | | U |
| | | Research and Development | | 36,289 | | | | | | | |
| Total National Defense Sealift Fund | | | | 36,289 | | | | | | | |

Department of the Navy
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Non RDT&E Title
(Dollars in Thousands)

Appropriation: 4557N National Defense Sealift Fund

| Line No | Program Element Number | Item | Act | FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA | FY 2017 Total PB Requests* with CR Adj Base + OCO | FY 2017 Less Enacted Div B P.L.114-254** OCO | FY 2017 Remaining Req with CR Adj Base + OCO | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Sec |
|---|---|---|---|---|---|---|---|---|---|---|---|
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| | | Research and Development | | | | | | 18,622 | | 18,622 | |
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| (U)CHALK EAGLE | 0603576N | 51 | 04 | Volume 2 - 391 |
| (U)Common Aviation Command and Control Sys (CAC2S) | 0206335M | 220 | 07 | Volume 5 - 545 |
| (U)Common Avionics | 0605217N | 155 | 05 | Volume 3 - 1299 |
| (U)Cooperative Engagement Capability | 0607658N | 196 | 07 | Volume 5 - 1 |
| (U)Cyber Operations Technology Development | 0306250M | 170 | 05 | Volume 3 - 1469 |

| Program Element Title | Program Element Number | Line # | BA | Page |
|---|---|---|---|---|
| (U)Deployable Joint Command and Control | 0607700N | 197 | 07 | Volume 5 - 21 |
| (U)Distributed Common Ground/Surface Systems | 0305208M | 239 | 07 | Volume 5 - 847 |
| (U)Executive Helo Development | 0604273N | 112 | 05 | Volume 3 - 357 |
| (U)Frigate Development | 0603599N | 57 | 04 | Volume 2 - 515 |
| (U)Future Naval Capabilities Advanced Tech Dev | 0603673N | 23 | 03 | Volume 1 - 399 |
| (U)Future Naval Capabilities Applied Research | 0602750N | 13 | 02 | Volume 1 - 257 |
| (U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80 | 0604112N | 79 | 04 | Volume 2 - 781 |
| (U)Ground/Air Task Oriented Radar (G/ATOR) | 0204460M | 209 | 07 | Volume 5 - 203 |
| (U)Innovative Naval Prototypes(INP) Applied Res | 0602792N | 15 | 02 | Volume 1 - 311 |
| (U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem | 0605813M | 163 | 05 | Volume 3 - 1421 |
| (U)Joint Light Tactical Vehicle(JLTV) EMD | 0605812M | 92 | 04 | Volume 2 - 945 |
| (U)Joint Strike Fighter (JSF) - EMD | 0604800M | 146 | 05 | Volume 3 - 1021 |
| (U)Joint Strike Fighter Follow On Mod (FoM) - MC | 0604810M | 148 | 05 | Volume 3 - 1081 |
| (U)Joint Strike Fighter Follow On Mod (FoM) - Navy | 0604810N | 149 | 05 | Volume 3 - 1095 |
| (U)Joint Theater Air and Missile Defense Org | 0605126N | 174 | 06 | Volume 4 - 35 |
| (U)LCS Mission Modules | 0603596N | 55 | 04 | Volume 2 - 479 |
| (U)LINK EVERGREEN | 0603764N | 72 | 04 | Volume 2 - 705 |
| (U)LINK PLUMERIA | 0603748N | 70 | 04 | Volume 2 - 701 |
| (U)LITTORAL COMBAT SHIP | 0603581N | 52 | 04 | Volume 2 - 393 |

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| (U)LX (R) | 0604454N | 86 | 04 | Volume 2 - 843 |
| (U)MANAGEMENT HQ - R&D | 0605898N | 189 | 06 | Volume 4 - 271 |
| (U)MH-XX | 0604292N | 84 | 04 | Volume 2 - 835 |
| (U)MQ-4C Triton | 0305220N | 241 | 07 | Volume 5 - 879 |
| (U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT | 0305241N | 247 | 07 | Volume 5 - 927 |
| (U)Manufacturing Technology Program | 0603680N | 24 | 03 | Volume 1 - 447 |
| (U)Marine Air Grnd Task Force(MAGTF)EW for Aviatio | 0604376M | 121 | 05 | Volume 3 - 507 |
| (U)Marine Corps Additive Manufacturing Tech Dev | 0604286M | 83 | 04 | Volume 2 - 831 |
| (U)Mission Planning | 0605215N | 154 | 05 | Volume 3 - 1277 |
| (U)Multi-Mission Maritime (MMA) Increment III | 0605504N | 161 | 05 | Volume 3 - 1397 |
| (U)Next Generation Fighter | 0605285N | 177 | 06 | Volume 4 - 57 |
| (U)Next Generation Jammer (NGJ) Increment II | 0604282N | 115 | 05 | Volume 3 - 393 |
| (U)Offensive Anti-Surface Warfare Weapon Dev | 0604786N | 91 | 04 | Volume 2 - 929 |
| (U)Ohio Replacement | 0603595N | 54 | 04 | Volume 2 - 461 |
| (U)PILOT FISH | 0603525N | 40 | 04 | Volume 2 - 239 |
| (U)Precision Strike Weapons Development Program | 0604659N | 89 | 04 | Volume 2 - 873 |
| (U)RETRACT ELM | 0603751N | 71 | 04 | Volume 2 - 703 |
| (U)RETRACT JUNIPER | 0603536N | 42 | 04 | Volume 2 - 243 |
| (U)RETRACT LARCH | 0603527N | 41 | 04 | Volume 2 - 241 |

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| (U)RETRACT MAPLE | 0603746N | 69 | 04 | Volume 2 - 699 |
| (U)RQ-21A | 0305239M | 246 | 07 | Volume 5 - 921 |
| (U)RQ-4 Modernization | 0305421N | 249 | 07 | Volume 5 - 943 |
| (U)Remote Minehunting System (RMS) | 0604122N | 80 | 04 | Volume 2 - 803 |
| (U)SEW Surveillance/Reconnaissance Support | 1206867N | 194 | 06 | Volume 4 - 307 |
| (U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0) | 0305234N | 245 | 07 | Volume 5 - 915 |
| (U)SPECIAL PROCESSES | 0603787N | 73 | 04 | Volume 2 - 707 |
| (U)Satellite Communications (SPACE) | 1203109N | 253 | 07 | Volume 5 - 987 |
| (U)Science & Tech Management - ONR Field Acts | 0602861N | 16 | 02 | Volume 1 - 325 |
| (U)Science & Tech Management - ONR Headquarters | 0602898N | 17 | 02 | Volume 1 - 329 |
| (U)Ship to Shore Connector (SSC) | 0605220N | 156 | 05 | Volume 3 - 1327 |
| (U)Special Applications Program | 0305124N | 169 | 05 | Volume 3 - 1465 |
| (U)T-AO 205 Class | 0605327N | 157 | 05 | Volume 3 - 1341 |
| (U)UAS Integration and Interoperability | 0305205N | 238 | 07 | Volume 5 - 835 |
| (U)Unman Carrier Launch A/B Surv & Strk(UCLASS)Sys | 0604404N | 123 | 05 | Volume 3 - 523 |
| (U)Unmanned Aerial Systems (UAS) Payloads | 0305242M | 248 | 07 | Volume 5 - 931 |
| (U)Virginia Payload Module (VPM) | 0604580N | 134 | 05 | Volume 3 - 777 |
| (U)Warfare Innovation Management | 0606355N | 190 | 06 | Volume 4 - 287 |
| AMRAAM | 0207163N | 226 | 07 | Volume 5 - 737 |

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| ASW Systems Development | 0603254N | 34 | 04 | Volume 2 - 87 |
| ASW Systems Development - MIP | 0303354N | 93 | 04 | Volume 2 - 955 |
| AV-8B Aircraft - Engine Dev | 0604214N | 98 | 05 | Volume 3 - 45 |
| Acoustic Search Sensors | 0604261N | 107 | 05 | Volume 3 - 231 |
| Advanced Above Water Sensors | 0604501N | 124 | 05 | Volume 3 - 537 |
| Advanced Combat Systems Tech | 0603382N | 36 | 04 | Volume 2 - 101 |
| Advanced Hawkeye | 0604234N | 105 | 05 | Volume 3 - 173 |
| Advanced Nuclear Power Systems | 0603570N | 49 | 04 | Volume 2 - 371 |
| Advanced Submarine System Development | 0603561N | 45 | 04 | Volume 2 - 263 |
| Advanced Surface Machinery Sys | 0603573N | 50 | 04 | Volume 2 - 375 |
| Air Control | 0604504N | 126 | 05 | Volume 3 - 625 |
| Air Crew Systems Development | 0604264N | 109 | 05 | Volume 3 - 275 |
| Air/Ocean Equipment Engineering | 0604218N | 101 | 05 | Volume 3 - 93 |
| Air/Ocean Tactical Applications | 0603207N | 30 | 04 | Volume 2 - 1 |
| Airborne Mine Countermeasures (AMCM) | 0604373N | 120 | 05 | Volume 3 - 485 |
| Amphibious Tactical Supt Units | 0204413N | 208 | 07 | Volume 5 - 197 |
| Aviation Improvements | 0205633N | 217 | 07 | Volume 5 - 375 |
| Aviation Survivability | 0603216N | 31 | 04 | Volume 2 - 59 |
| CH-53K | 0605212N | 153 | 05 | Volume 3 - 1263 |

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|---|---|---|---|---|
| Cancelled Account Adjustments | 0909999N | 193 | 06 | Volume 4 - 305 |
| Carrier Systems Development | 0603512N | 39 | 04 | Volume 2 - 229 |
| Center For Naval Analyses | 0605154N | 176 | 06 | Volume 4 - 47 |
| Combat Information Center Conv | 0604518N | 128 | 05 | Volume 3 - 671 |
| Combat System Integration | 0603582N | 53 | 04 | Volume 2 - 421 |
| Common Picture Applied Research | 0602235N | 7 | 02 | Volume 1 - 159 |
| Consolidated Afloat Network Ent Services(CANES) | 0303138N | 232 | 07 | Volume 5 - 777 |
| Consolidated Trng Sys Dev | 0204571N | 210 | 07 | Volume 5 - 217 |
| Conventional Munitions | 0603609N | 58 | 04 | Volume 2 - 529 |
| Cooperative Engagement | 0603658N | 62 | 04 | Volume 2 - 585 |
| Cryptologic Direct Support | 0204574N | 211 | 07 | Volume 5 - 249 |
| DDG-1000 | 0204202N | 164 | 05 | Volume 3 - 1431 |
| Defense Research Sciences | 0601153N | 3 | 01 | Volume 1 - 19 |
| Deployable JT Cmd & Control | 0603237N | 32 | 04 | Volume 2 - 75 |
| Depot Maintenance (NON-IF) | 0702207N | 251 | 07 | Volume 5 - 965 |
| Directed Energy and Electric Weapon System | 0603925N | 78 | 04 | Volume 2 - 757 |
| Distributed Common Ground Sys | 0305208N | 240 | 07 | Volume 5 - 859 |
| EA-18 Squadrons | 0604269N | 110 | 05 | Volume 3 - 289 |
| Elect Warfare Readiness Supt | 0204575N | 212 | 07 | Volume 5 - 253 |

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| Electromagnetic Systems Advanced Technology | 0603271N | 20 | 03 | Volume 1 - 349 |
| Electromagnetic Systems Applied Research | 0602271N | 9 | 02 | Volume 1 - 197 |
| Electronic Warfare (EW) Dev | 0604270N | 111 | 05 | Volume 3 - 305 |
| Electronic Warfare Development - MIP | 0304270N | 95 | 04 | Volume 2 - 969 |
| Environmental Protection | 0603721N | 64 | 04 | Volume 2 - 615 |
| F/A-18 Squadrons | 0204136N | 203 | 07 | Volume 5 - 85 |
| Facilities Improvement | 0603725N | 66 | 04 | Volume 2 - 673 |
| Fleet Tactical Development | 0204163N | 204 | 07 | Volume 5 - 123 |
| Force Protection Advanced Technology | 0603123N | 19 | 03 | Volume 1 - 339 |
| Force Protection Applied Res | 0602123N | 5 | 02 | Volume 1 - 109 |
| Global Combat Support Systems - Marine Corps | 0219902M | 227 | 07 | Volume 5 - 749 |
| H-1 Upgrades | 0604245N | 106 | 05 | Volume 3 - 219 |
| Harm Improvement | 0205601N | 213 | 07 | Volume 5 - 283 |
| In-House Lab Independent Res | 0601152N | 2 | 01 | Volume 1 - 9 |
| Information Sys Security Program | 0303140N | 233 | 07 | Volume 5 - 787 |
| Information Technology Development | 0605013N | 151 | 05 | Volume 3 - 1129 |
| Integrated Surveillance System | 0204311N | 207 | 07 | Volume 5 - 181 |
| Intelligence Engineering | 0604761N | 143 | 05 | Volume 3 - 965 |
| JT Cntr Radio Controlled IED Elec War (JCREW) | 0604653N | 88 | 04 | Volume 2 - 869 |

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| JT Military Intel Programs | 0305192N | 236 | 07 | Volume 5 - 825 |
| JT Non-Lethal Wpns Applied Res | 0602651M | 11 | 02 | Volume 1 - 239 |
| JT Non-Lethal Wpns Tech Dev | 0603651M | 22 | 03 | Volume 1 - 393 |
| JT Precision Approach & Ldg Sys | 0603860N | 77 | 04 | Volume 2 - 745 |
| JT Service EOD | 0604654N | 137 | 05 | Volume 3 - 817 |
| JT Service Explosive Ordn Dev | 0603654N | 61 | 04 | Volume 2 - 553 |
| JT Strike Fighter (JSF) - EMD | 0604800N | 147 | 05 | Volume 3 - 1051 |
| JT Tact Radio Sys (JTRS) | 0604280N | 114 | 05 | Volume 3 - 389 |
| Joint Air-to-ground Missile (JAGM) | 0605450N | 159 | 05 | Volume 3 - 1365 |
| Joint Non-Lethal Weapons Testing | 0603851M | 76 | 04 | Volume 2 - 733 |
| Joint Standoff Weapon Systems | 0604727N | 139 | 05 | Volume 3 - 837 |
| Judgment Fund Reimbursement | 0909980N | 192 | 06 | Volume 4 - 303 |
| LPD-17 Class Systems Integration | 0604311N | 117 | 05 | Volume 3 - 435 |
| Land Attack Tech | 0603795N | 75 | 04 | Volume 2 - 713 |
| Lightweight Torpedo Development | 0604610N | 136 | 05 | Volume 3 - 801 |
| MC Advanced Technology Demo | 0603640M | 21 | 03 | Volume 1 - 361 |
| MC Ground Cmbt Spt Arms Sys | 0206623M | 221 | 07 | Volume 5 - 557 |
| MK-48 ADCAP | 0205632N | 216 | 07 | Volume 5 - 363 |
| MQ-8 UAV | 0305231N | 242 | 07 | Volume 5 - 891 |

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| Major T&E Investment | 0604759N | 173 | 06 | Volume 4 - 27 |
| Management Headquarters (Departmental Spt Acts) | 0902498N | 191 | 06 | Volume 4 - 299 |
| Management, Technical & Intl Supt | 0605853N | 180 | 06 | Volume 4 - 107 |
| Marine Corps Assault Vehicles | 0603611M | 59 | 04 | Volume 2 - 535 |
| Marine Corps Cmbt Services Supt | 0206624M | 222 | 07 | Volume 5 - 637 |
| Marine Corps Comms Systems | 0206313M | 219 | 07 | Volume 5 - 419 |
| Marine Corps Grnd Cmbt/Supt Sys | 0603635M | 60 | 04 | Volume 2 - 547 |
| Marine Corps IT Dev/Mod | 0605013M | 150 | 05 | Volume 3 - 1109 |
| Marine Corps Lndg Force Tech | 0602131M | 6 | 02 | Volume 1 - 135 |
| Marine Corps Program Wide Supt | 0605873M | 188 | 06 | Volume 4 - 259 |
| Maritime Tech (MARITECH) | 0708730N | 252 | 07 | Volume 5 - 983 |
| Medical Development | 0604771N | 144 | 05 | Volume 3 - 969 |
| Mine & Exp Warfare Applied Res | 0602782N | 14 | 02 | Volume 1 - 301 |
| Mine Development | 0604601N | 135 | 05 | Volume 3 - 787 |
| Mine and Expeditionary Warfare Advanced Technology | 0603782N | 28 | 03 | Volume 1 - 475 |
| Modeling & Simulation Support | 0308601N | 250 | 07 | Volume 5 - 957 |
| Multi-Mssn Helicopter Upgrade Dev | 0604216N | 100 | 05 | Volume 3 - 81 |
| Multi-mssn Maritime Aircraft (MMA) (P-8A) | 0605500N | 160 | 05 | Volume 3 - 1375 |
| NATO Research and Deve | 0603790N | 74 | 04 | Volume 2 - 709 |

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| Nav Integrated Fire Control-Counter Air Sys Eng | 0604378N | 122 | 05 | Volume 3 - 513 |
| Navigation/Id System | 0604777N | 145 | 05 | Volume 3 - 975 |
| Navy Energy Program | 0603724N | 65 | 04 | Volume 2 - 641 |
| Navy Logistic Productivity | 0603739N | 68 | 04 | Volume 2 - 689 |
| Navy Meteorological and Ocean Sensors-Space(METOC) | 0305160N | 235 | 07 | Volume 5 - 821 |
| Navy Space & Electr Warfare Supt | 0605866N | 186 | 06 | Volume 4 - 243 |
| Navy Strategic Comms | 0101402N | 201 | 07 | Volume 5 - 61 |
| Navy Tactical Computer Resources | 0604574N | 133 | 05 | Volume 3 - 771 |
| Navy Warfighting Exp & Demo | 0603758N | 27 | 03 | Volume 1 - 467 |
| New Design SSN | 0604558N | 130 | 05 | Volume 3 - 695 |
| Next Generation Jammer (NGJ) | 0604274N | 113 | 05 | Volume 3 - 373 |
| Ocean Engineering Tech Dev | 0603713N | 63 | 04 | Volume 2 - 603 |
| Ocean Wrfghtg Env Applied Res | 0602435N | 10 | 02 | Volume 1 - 223 |
| Operational Nuclear Power Sys | 0205675N | 218 | 07 | Volume 5 - 417 |
| Operational Test & Eval Capability | 0605865N | 185 | 06 | Volume 4 - 237 |
| Other Helicopter Development | 0604212N | 97 | 05 | Volume 3 - 19 |
| P-3 Modernization Program | 0604221N | 102 | 05 | Volume 3 - 101 |
| Personnel, Trng, Sim, & Human Factors | 0604703N | 138 | 05 | Volume 3 - 823 |
| Power Proj Applied Research | 0602114N | 4 | 02 | Volume 1 - 93 |

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| Power Projection Advanced Technology | 0603114N | 18 | 03 | Volume 1 - 333 |
| RDT&E Science & Tech Mgmt | 0605861N | 182 | 06 | Volume 4 - 185 |
| RDT&E Ship & Aircraft Support | 0605863N | 183 | 06 | Volume 4 - 197 |
| RQ-11 UAV | 0305232M | 243 | 07 | Volume 5 - 905 |
| RQ-7 UAV | 0305233N | 244 | 07 | Volume 5 - 911 |
| Radiological Control | 0603542N | 43 | 04 | Volume 2 - 245 |
| Rapid Technology Capability Prototype | 0604320M | 85 | 04 | Volume 2 - 839 |
| Rapid Technology Transition (RTT) | 0203761N | 202 | 07 | Volume 5 - 81 |
| SEW Architecture/Eng Support | 0604707N | 90 | 04 | Volume 2 - 883 |
| SSBN Security Tech Program | 0101224N | 199 | 07 | Volume 5 - 47 |
| SSN-688 & Trident Modernization | 0604503N | 125 | 05 | Volume 3 - 573 |
| Satellite Communications (Space) | 0303109N | 231 | 07 | Volume 5 - 753 |
| Ship Concept Advanced Design | 0603563N | 47 | 04 | Volume 2 - 323 |
| Ship Contract Design/ Live Fire T&E | 0604567N | 132 | 05 | Volume 3 - 733 |
| Ship Prel Design & Feasibility Studies | 0603564N | 48 | 04 | Volume 2 - 351 |
| Ship Self Def (Detect & Cntrl) | 0604755N | 140 | 05 | Volume 3 - 845 |
| Ship Self Def (Engage: Hard Kill) | 0604756N | 141 | 05 | Volume 3 - 889 |
| Ship Self Def (Engage: Soft Kill/EW) | 0604757N | 142 | 05 | Volume 3 - 923 |
| Shipboard Aviation Systems | 0604512N | 127 | 05 | Volume 3 - 657 |

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|---|---|---|---|---|
| Small Business Innovative Research | 0605502N | 178 | 06 | Volume 4 - 61 |
| Small Diameter Bomb (SDB) | 0604329N | 118 | 05 | Volume 3 - 441 |
| Space & Elec War Surv/Recon | 0605867N | 187 | 06 | Volume 4 - 253 |
| Standard Missile Improvements | 0604366N | 119 | 05 | Volume 3 - 459 |
| Standards Development | 0604215N | 99 | 05 | Volume 3 - 59 |
| Strategic Sub & Wpns Sys Supt | 0101221N | 198 | 07 | Volume 5 - 25 |
| Strategic Technical Support | 0605856N | 181 | 06 | Volume 4 - 177 |
| Studies & Analysis Supt - Navy | 0605152N | 175 | 06 | Volume 4 - 39 |
| Submarine Acoustic War Dev | 0101226N | 200 | 07 | Volume 5 - 49 |
| Submarine Tactical Warfare Sys | 0603562N | 46 | 04 | Volume 2 - 315 |
| Submarine Tactical Warfare System | 0604562N | 131 | 05 | Volume 3 - 717 |
| Surface & Shallow Water MCM | 0603502N | 37 | 04 | Volume 2 - 155 |
| Surface ASW | 0603553N | 44 | 04 | Volume 2 - 259 |
| Surface ASW Cmbt Sys Integr | 0205620N | 215 | 07 | Volume 5 - 347 |
| Surface Combatant Cmbt Sys Eng | 0604307N | 116 | 05 | Volume 3 - 405 |
| Surface Ship Torpedo Defense | 0603506N | 38 | 04 | Volume 2 - 215 |
| Surface Support | 0204228N | 205 | 07 | Volume 5 - 145 |
| Tact Air Dir Infrared CM (TADIRCM) | 0604272N | 81 | 04 | Volume 2 - 811 |
| Tactical Aim Missiles | 0207161N | 225 | 07 | Volume 5 - 723 |

| Program Element Title | Program Element Number | Line # | BA | Page |
|---|---|---|---|---|
| Tactical Airborne Reconnaissance | 0603261N | 35 | 04 | Volume 2 - 93 |
| Tactical Command System | 0604231N | 104 | 05 | Volume 3 - 119 |
| Tactical Command System - MIP | 0304231N | 167 | 05 | Volume 3 - 1439 |
| Tactical Cryptologic Systems | 0304785N | 168 | 05 | Volume 3 - 1443 |
| Tactical Data Links | 0205604N | 214 | 07 | Volume 5 - 305 |
| Tactical Unmanned Aer Vehicles | 0305204N | 237 | 07 | Volume 5 - 829 |
| Target Systems Development | 0604258N | 172 | 06 | Volume 4 - 15 |
| Technical Information Services | 0605804N | 179 | 06 | Volume 4 - 101 |
| Test & Evaluation Support | 0605864N | 184 | 06 | Volume 4 - 209 |
| Threat Simulator Development | 0604256N | 171 | 06 | Volume 4 - 1 |
| Tomahawk Mssn Planning Ctr | 0204229N | 206 | 07 | Volume 5 - 159 |
| Training System Aircraft | 0603208N | 96 | 05 | Volume 3 - 1 |
| USMC Intelligence/Electronics Warfare Sys | 0206625M | 223 | 07 | Volume 5 - 671 |
| Undersea Warfare Advanced Tech | 0603747N | 26 | 03 | Volume 1 - 461 |
| Undersea Warfare Applied Res | 0602747N | 12 | 02 | Volume 1 - 243 |
| University Research Initiatives | 0601103N | 1 | 01 | Volume 1 - 1 |
| V-22A | 0604262N | 108 | 05 | Volume 3 - 245 |
| Warfare Support System | 0604230N | 103 | 05 | Volume 3 - 105 |
| Warfighter Protection Adv Tech | 0603729N | 25 | 03 | Volume 1 - 455 |

| Program Element Title | Program Element Number | Line # | BA | Page |
|---|---|---|---|---|
| Warfighter Sustainment Applied Res | 0602236N | 8 | 02 | Volume 1 - 179 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0607658N *I (U)Cooperative Engagement Capability* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 601.250 | 0.000 | 84.501 | 92.571 | - | 92.571 | 103.279 | 111.178 | 111.616 | 112.306 | Continuing | Continuing |
| 2039: *COOP Engagement* | 601.250 | 0.000 | 84.501 | 92.571 | - | 92.571 | 103.279 | 111.178 | 111.616 | 112.306 | Continuing | Continuing |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 582 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control.

CEC distributes sensor data from each USMC Command Control Unit, USA Aerostat, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system.

CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track.

The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607658N *I (U)Cooperative Engagement Capability* |

A family of antennas approach will be used to satisfy CEC requirements with lower life cycle costs (procurement, installation, and maintenance). These antennas enable future capability as well as providing a solution extensible to additional platforms. This effort for development and production of Common Array Block (CAB) antennas was competitively awarded in late FY2013.

In support of Interoperability, CEC will continue to work collaboratively with other Combat Systems programs (AWS, E-2C, E-2D, SSDS, CDLMS, C2P, CAC2S and SGS/AC) to develop software and implement design corrections and system changes.

FY 2016 efforts funded under Program Element 0603658N

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 84.501 | 88.945 | - | 88.945 |
| Current President's Budget | 0.000 | 84.501 | 92.571 | - | 92.571 |
| Total Adjustments | 0.000 | 0.000 | 3.626 | - | 3.626 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 3.400 | - | 3.400 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.226 | - | 0.226 |

**Change Summary Explanation**

FY 2018 funding is increased by $3.400M for Enterprise Air Surveillance Radar integration efforts.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0607658N / *(U)Cooperative Engagement Capability* | Project (Number/Name)<br>2039 / *COOP Engagement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2039: *COOP Engagement* | 601.250 | 0.000 | 84.501 | 92.571 | - | 92.571 | 103.279 | 111.178 | 111.616 | 112.306 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 582

**A. Mission Description and Budget Item Justification**

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control.

CEC distributes sensor data from each USMC Command Control Unit, USA Aerostat, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system.

CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track.

The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.

A family of antennas approach will be used to satisfy CEC requirements with lower life cycle costs (procurement, installation, and maintenance). These antennas enable future capability as well as providing a solution extensible to additional platforms. This effort for development and production of Common Array Block (CAB) antennas was competitively awarded in late FY2013.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

In support of Interoperability, CEC will continue to work collaboratively with other Combat Systems programs (AWS, E-2C, E-2D, SSDS, CDLMS, C2P, CAC2S and SGS/AC) to develop software and implement design corrections and system changes.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** E-2D | 0.000 | 2.800 | 3.900 | 0.000 | 3.900 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Support initial DSSC 3 lab and flight testing focused on Mode 5 capabilities. Develop DSSC 3 CEC AMIIP and IFC-I capable software and support related lab and flight testing. Analyze test data and implement corrective actions. Conduct technical interchange and implementation planning with the E-2D community on upcoming CEC capability improvements slated for release in DSSC 3./4 timeframes. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue E-2D CEC Accelerated Midterm Interoperability Improvement Project (AMIIP), Mode 5/S, IFF Modernization, and Naval Integrated Fire Control-Counter Air (NIFC-CA)/Increment 2 enhancements systems engineering and software development efforts, and support E-2D CEC DSSC 3 and Developmental Testing (DT) flight testing in conjunction with E-2D DSSC 3 software development and test. Continue systems engineering efforts related to introduction of Signal Data Processor-Sierra (SDP-S)-005 on E-2D. Begin E2D DSSC 4 requirements development. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** B/L 2.1 INTEGRATION AND FOT&E TESTING | 0.000 | 9.000 | 11.000 | 0.000 | 11.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>CEC will accomplish CEC Interim Training (CIT) testing in Land Based Wallop Island Test Facilities as well as aboard USN Ships in concert with Fleet Synthetic Training (FSI); Conduct Naval Integrated Fire Control-Counter Air (NIFC-CA) Live Fire Test (LFT) #5, and NIFC-CA At Sea 4 Live Fire Test. CEC will also conduct CEC testing aboard, USS MILIUS (DDG 69) during Combat System Ship Qualification Trial (CSSQT), and will conduct a | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| CVN 78 TRACKEX and developmental testing as well as a DDG 1000 TRACKEX for Developmental Testing. CEC will commence Network Enabled Electronic Defense System (NEEDS) Testing.<br>***FY 2018 Base Plans:***<br>CEC will continue support of NIFC-CA testing, Developmental Testing (DT)-D2 of AN/USG-2B with CVN 78. DT-D3 of AN/USG-2B with DDG 1000. CEC will commence DT-D4 of AN/USG-2B with Aegis ACB 16 as well as commence testing of Common Array Block (CAB) antenna systems for both the USN and USMC antenna designs. CEC will continue testing of Network Enabled Electronic Defense System (NEEDS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SYSTEM IMPROVEMENTS | 0.000 | 15.801 | 25.971 | 0.000 | 25.971 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Continue development and integration efforts with multiple Advanced Capability Build (ACB) 16 combat system by completing CEC ACB 16 Critical Design Reviews (CDR) and delivered design for continued developmental/ integration testing. Continue integration efforts for CEC with the CVN 78 combat system, including Ship Self Defense System (SSDS) and the Dual Band Radar (DBR) and also continue integration efforts with the DDG 1000 combat system with the Total Ship Computing Environment (TSCE) combat system and the Multi-Function Radar (MFR). The integration of the DBR and MFR are first of their kind and require significant integration work with a radar system that is different than any previously used by CEC. Moreover, much of the DBR and MFR radar integration efforts must be accomplished on the actual warships due to very limited availability of suitable radar assets at the Land Based Test Sites. Updated CEC element certification for new features put into the CEC baseline. This will involved testing to garner evidence, analyzing the results and then obtaining permission for the CEC element certification panel and then from the combat system certification panel(s) to field the update. Continue Common Array Block (CAB) antenna integration efforts. Provide CEC comments and support meetings for the development of the EASR Interface Documents.<br>***FY 2018 Base Plans:***<br>CEC will begin CEC enhanced training (CET) Integration and test, and will complete first CET installation on AEGIS. For SSDS ACB 20 CEC will conduct SBR-1 and for DDG 1000 we will complete Product Release Panel | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| (PRP) and begin integration and test aboard DDG 1000 and the Self Defense Test Ship. We will conduct an FQT for CVN 78 resulting in a certified software load. CEC will conduct Trade Studies to identify and refine requirements related to SPY-6/ACB 20 integration to support SPY-6 Milestone C as well as SPY-6 related ACB 20 Technical Interchange Meetings (TIMs) and monthly engineering level meetings. CEC will also conduct a CEC SFR/PDR supporting integration with SPY-6 and ACB 20. Continue development of NIFC-CA Increment 2 CEC software with Wrap Around Simulation Program (WASP) updates, and prototyping of advanced kernel and adaptive layer functions. Continue to integrate CEC Air and Missile Defense Radar (AMDR) Adaptive Layer with Aegis Combat System Interface Support Equipment (CSISE) AMDR Mature CEC AMDR Adaptive layer based on findings from CIT-1 and 2.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** NETWORK ENABLED ELECTRONIC DEFENSE SYSTEM (NEEDS)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Continue iterative Code and Unit Test software development process. Deliver Engineering Load of NEEDS software for Engineering Verification Test (EVT) prior to Verification and Validation (V&V) Testing in Red Nitrum 17.<br>***FY 2018 Base Plans:***<br>Continue developmental field testing at LBTS and update NEEDS Software as indicated by analysis. Conduct CEC PRP in support of DDG-79 ALO.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 6.600<br>- | 4.500<br>- | 0.000<br>- | 4.500<br>- |
| ***Title:*** FIELD ACTIVITIES<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:*** | 0.000<br>- | 8.500<br>- | 8.600<br>- | 0.000<br>- | 8.600<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent (SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding of systems improvements and maintenance efforts (CAB, Airways Database, and Master Ship List updates.<br>***FY 2018 Base Plans:***<br>Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent (SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding of systems improvements and maintenance efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** COMMON ARRAY BLOCK (CAB) ANTENNA | 0.000 | 10.200 | 16.300 | 0.000 | 16.300 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Conduct CAB FoA system-level Development Verification Testing (DVT). Complete the Build and Test of T/R Modules for EDM and PPU. Deliver software builds 2 and 3. Begin ordering Long-Lead Time Material for Pre-production Units (PPU).<br>***FY 2018 Base Plans:***<br>Continue Engineering Development Model (EDM) fabrication and deliver EDM hardware. Perform EDM component level Functional Verification Testing, CAB-S EDM Array Integration and Test and Evaluation, EDM Integration and Test and Functional Verification Testing at the system level. Prepare for and conduct Pre-Production Readiness Review and commence material procurement and perform fabrication of 4 CAB-S and 3 CAB-E Pre Production Units. Develop, code, unit test, and deliver CAB software Build 4. Complete Antenna Power Supply Unit build and test. Complete CAB-S and CAB-E Installation Design Packages, and address platform customer CAB installation design issues/questions. Develop and deliver CAB Interactive Electronic Technical Manuals, Corrective Maintenance Exercises, and Product Structure Engineering Change Proposals.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** AIR AND MISSILE DEFENSE RADAR (AMDR)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Conduct a CEC AMDR Combat System (CS) Early Integration Project (EIP) Software Build Technical Interchange Meeting (SBT) #3. Conduct Combat System Integration Test (CIT) CIT-1 and CIT-2 and continue planning support and test equipment deliveries in support of planned CIT-2. Participate in SRR for Aegis ACB 20 (BL 10)<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 9.500<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** NAVAL INTEGRATED FIRE CONTROL-COUNTER AIR (NIFC-CA)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Complete Preliminary Design Review (PDR)and Critical Design Review (CDR) for NIFC-CA kernel with Wrap Around Simulation Program (WASP) updates, and prototyping of advanced kernel and adaptive layer functions.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 5.700<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** FIRE CONTROL LOOP IMPROVEMENT INITIATIVE (FCLIP) PHASE 2<br>***Articles:***<br>***FY 2016 Accomplishments:*** | 0.000<br>- | 9.400<br>- | 8.400<br>- | 0.000<br>- | 8.400<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2017 Plans:***<br>Continue development efforts for Ship Self Defense System (SSDS) Combat System updates, SPQ-9B and CIWS sensor integration and begin planning efforts for follow-on integration and testing phases in close collaboration with other IWS elements in preparation for fielding.<br>***FY 2018 Base Plans:***<br>Complete development efforts (through software Release R6) for FCLIP Phase 2, which includes Ship Self Defense System (SSDS) Combat System updates, CIWS sensor integration and Mk9 Multi-Target Tracking (MTT). Transition to follow-on integration and testing phase in close coordination with sensors and SSDS combat system, and provide CEC support for execution of Trackex #1, scheduled for Q4FY18.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** CEC INCREMENT 2 | 0.000 | 1.900 | 2.100 | 0.000 | 2.100 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Begin Composite Surface Tracking (CST) development effort, with System Functional Review (SFR) and System Requirement Review (SRR), to integrate surface radar data and provide it across the CEC Data Distribution System (DDS)<br>Radio to all other networked platforms. In addition to leveraging ongoing Close In Weapons System (CIWS) Sensor<br>Adaptive Layer efforts in FCLIP, begin development of advanced CEC kernel functions to provide surface tracking specific<br>environmental filters to also leverage surface radar measurements from existing sensors. Develop conceptual approach<br>leading to a 2018 demonstration of an Automated Battle Management Aid (ABMA). Coordinate with candidate ABMA's<br>such as the Electronic Warfare Battle Management (EWBM) and examine approaches with potential for successful way | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| forward to field force level features across battle groups.<br>***FY 2018 Base Plans:***<br>Continue CST development effort with Preliminary Design Review (PDR) to integrate surface radar data. In addition to leveraging ongoing Close In Weapons System (CIWS) Sensor Adaptive Layer efforts in FCLIP, begin development of advanced CEC kernel functions to provide surface tracking specific environmental filters to also leverage surface radar measurements from existing sensors. Refine and execute a 2018 demonstration of an Automated Battle Management Aid (ABMA). Coordinate with candidate ABMA's such as the Electronic Warfare Battle Management (EWBM) and examine approaches with potential for successful way forward to field force level features across battle groups.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** PROGRAM PROTECTION<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resistant anti-tamper technologies. CEC worked closely with the Cyber Assessment Agency and Defense Assessment Management Office to access impacts to the program from exploitation.<br>***FY 2018 Base Plans:***<br>Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, | 0.000<br>- | 5.100<br>- | 8.400<br>- | 0.000<br>- | 8.400<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resistant anti-tamper technologies. CEC will work closely with the Cyber Assessment Agency and Defense<br>Assessment Management Office to access impacts to the program from exploitation.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** ENTERPRISE AIR SURVEILLANCE RADAR (EASR)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Continue efforts started in FY 2017 under the CEC System Improvements line to provide CEC comments and support meetings for the development of the EASR Interface Functional Description (IFD), Interface Requirements Specification (IRS), Interface Description Document (IDD) and Interface Description Language (IDL). Support IWS2 lead EASR program SETR milestones and Sprint reviews. Begin initial development for CEC adaptive layers for Fixed and Rotator variants of EASR for CVN and L-Class ships. Prepare for and conduct CEC-EASR SRR/SWBLR and CEC-EASR SBR #1.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 3.400<br>- | 0.000<br>- | 3.400<br>- |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 84.501 | 92.571 | 0.000 | 92.571 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • SCN: *Navy, SCN* | 34.100 | 21.200 | 30.400 | - | 30.400 | 18.100 | 12.500 | 12.700 | 12.800 | 51.200 | 507.031 |
| • APN/0204152N: *Navy, APN* | 16.263 | 19.886 | 16.897 | - | 16.897 | 13.788 | 14.064 | 14.345 | 14.632 | 57.200 | 401.044 |
| • OPN/2606: *CEC* | 25.695 | 22.034 | 23.892 | - | 23.892 | 37.483 | 32.467 | 32.142 | 32.791 | 40.774 | 1,037.942 |
| • RDT&E/0206313M: *USMC* | 0.762 | 3.634 | 2.092 | - | 2.092 | 1.255 | 0.752 | 0.730 | 0.730 | 0.000 | 32.577 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDT&E/0206335M: *USMC* | 0.473 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.510 |
| • O&M,N/0206626M: *USMC* | 1.725 | 2.291 | 3.157 | - | 3.157 | 3.062 | 2.970 | 2.881 | 2.881 | 0.000 | 28.022 |
| • PMC/0206313M: *USMC* | 0.680 | 1.164 | 8.390 | - | 8.390 | 8.070 | 3.550 | 0.000 | 0.000 | 0.000 | 24.558 |
| • OPN/0900: *DDG/MOD* | 2.400 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 63.911 |
| • OPN/0960: *CG MOD* | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 6.230 | 6.355 | 0.000 | 12.585 |

**Remarks**

**D. Acquisition Strategy**

CEC Acquisition Strategy (AS) approved by OSD (AT&L) on 19 January 2010. CEC Acquisition Plan (AP) approved September 2013. Full Rate Production for CEC AN/USG-3B variant approved April 2014.

Contracts:
Common Array Block (CAB) antenna - contract competitively awarded 4Qtr FY2013.
CEC Design Agent/Engineering Services (DA/ES) follow-on sole source contract awarded 4Qtr FY2013.
CEC Production - Contract competitively awarded in 2Qtr FY2015.
CEC DA/ES contract will be competitively awarded 1Qtr FY2019. For DA, The contractor will maintain the CEC hardware and software development environment and testing infrastructure including; Systems and Software Laboratories, the external RF Range, the Compact Antenna Range, and the CEC Classified Development LAN. For ES, the contractor will provide analysis, design, implementation, integration, testing and evaluation, reliability and maintainability, quality assurance, safety, security, Integrated Logistics Support (ILS), and Configuration Management (CM).

**E. Performance Metrics**

- Complete the adaptive layer development for the E-2D aircraft. Provide technical support for installation and integration in the Northrop Grumman Systems Integration Laboratory, on board the test aircraft and support the Developmental testing. Continue E-2D Advanced Hawkeye aircraft CEC integration efforts.
- Continue AEGIS Advance Capability Builds CEC integration and demonstration efforts.
- Continue Naval Integrated Fire Control - Counter Air (NIFC-CA) CEC integration and demonstration efforts.
- Continue Crypto Modernization Tech Refresh efforts.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0607658N / *(U)Cooperative Engagement Capability* | Project (Number/Name)<br>2039 / *COOP Engagement* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/USG-2/3 Design Agent/Engineering Services | C/CPFF | Raytheon : St. Petersburg, FL | 127.395 | 0.000 | | 9.799 | Jan 2017 | 13.328 | Oct 2017 | - | | 13.328 | Continuing | Continuing | Continuing |
| TDA | C/CPFF | JHU/APL : Laurel, MD | 78.150 | 0.000 | | 9.535 | Feb 2017 | 13.176 | Oct 2017 | - | | 13.176 | Continuing | Continuing | Continuing |
| SI/DA | C/CPAF | General Dynamics : Fairfax, VA | 23.979 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 23.979 | - |
| SI/DA | C/CPAF | Award Fees : Not Specified | 2.903 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.903 | - |
| DDG 1000 | C/CPAF | Raytheon : Massachusetts | 10.983 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.983 | - |
| DDG 1000 | C/CPAF | Award Fees : Not Specified | 0.447 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.447 | - |
| NIFC-CA Integration | Various | Various : Various | 41.799 | 0.000 | | 5.700 | Jan 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| In-Service Engineering Activity | WR | NSWC : Port Hueneme, CA | 6.463 | 0.000 | | 1.825 | Dec 2016 | 3.305 | Oct 2017 | - | | 3.305 | Continuing | Continuing | Continuing |
| Software Support Activity/ SEIA | WR | NSWC : Dahlgren, VA | 19.718 | 0.000 | | 1.884 | Dec 2016 | 3.367 | Oct 2017 | - | | 3.367 | Continuing | Continuing | Continuing |
| Production Engineering Activity | WR | NSWC : Crane, IN | 5.694 | 0.000 | | 0.258 | Dec 2016 | 0.395 | Oct 2017 | - | | 0.395 | 0.000 | 6.347 | - |
| JTRS | Various | Various : Various | 8.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.500 | - |
| Various | WR | Various : Various | 31.873 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| NAVSSI | WR | SPAWAR : San Diego, CA | 0.368 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.368 | - |
| Certification | MIPR | NSA : Fort Meade, MD | 1.200 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.200 | - |
| Certification | WR | SPAWAR : Charleston, SC | 0.930 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.930 | - |
| Joint Exercises | WR | Various : Various | 3.744 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.744 | - |
| LBTS Testing | WR | CDSA Dam Neck : Virginia Beach, VA | 7.495 | 0.000 | | 0.500 | Dec 2016 | 0.500 | Oct 2017 | - | | 0.500 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0607658N / *(U)Cooperative Engagement Capability* | Project (Number/Name)<br>2039 / *COOP Engagement* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LBTS Testing | WR | SCSC : Wallops Island, VA | 7.083 | 0.000 | | 0.500 | Jan 2017 | 0.500 | Oct 2017 | - | | 0.500 | Continuing | Continuing | Continuing |
| E-2D Integration | Various | Various : Various | 47.758 | 0.000 | | 2.800 | Feb 2017 | 3.900 | Oct 2017 | - | | 3.900 | Continuing | Continuing | Continuing |
| MSI/NCCT | MIPR | Wright Patterson AFB : Dayton, OH | 1.228 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.228 | - |
| Common Array Block Development | C/CPFF | Raytheon : St. Petersburg, FL | 40.561 | 0.000 | | 10.200 | Jan 2017 | 16.300 | Oct 2017 | - | | 16.300 | Continuing | Continuing | Continuing |
| NEEDS | Various | Various : Various | 31.930 | 0.000 | | 6.600 | Feb 2017 | 4.500 | Oct 2017 | - | | 4.500 | Continuing | Continuing | Continuing |
| AMDR | Various | Various : Various | 12.012 | 0.000 | | 9.500 | Feb 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| JTMC | C/CPFF | Raytheon : St. Petersburg, FL | 1.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.000 | - |
| FCLIP | Various | Various : Various | 7.100 | 0.000 | | 9.400 | Feb 2017 | 8.400 | Oct 2017 | - | | 8.400 | Continuing | Continuing | Continuing |
| CEC Increment 2 | Various | Various : Various | 0.000 | 0.000 | | 1.900 | Feb 2017 | 2.100 | Oct 2017 | - | | 2.100 | Continuing | Continuing | Continuing |
| Program Protection | C/BA | NSMA : Washington, DC | 0.000 | 0.000 | | 5.100 | Feb 2017 | 8.400 | Oct 2017 | - | | 8.400 | Continuing | Continuing | Continuing |
| EASR | Various | Various : Various | 0.000 | 0.000 | | 0.000 | | 3.400 | Oct 2017 | - | | 3.400 | 0.000 | 3.400 | - |
| | | **Subtotal** | 520.313 | 0.000 | | 75.501 | | 81.571 | | - | | 81.571 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test/ACB Support | C/CPFF | Raytheon : St. Petersburg, FL | 5.114 | 0.000 | | 1.113 | Feb 2017 | 1.308 | Oct 2017 | - | | 1.308 | Continuing | Continuing | Continuing |
| Test/ACB Support | C/CPFF | JHU/APL : Laurel, MD | 2.676 | 0.000 | | 1.058 | Feb 2017 | 1.816 | Oct 2017 | - | | 1.816 | Continuing | Continuing | Continuing |
| Test Support | WR | NRL : Washington, DC | 0.313 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.313 | - |
| Test/ACB Support | WR | NSWC : Port Hueneme, CA | 24.386 | 0.000 | | 1.895 | Feb 2017 | 2.147 | Oct 2017 | - | | 2.147 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air Operations Test Support | WR | NAVAIR (PMA207) : Patuxent River, MD | 10.187 | 0.000 | | 1.047 | Feb 2017 | 1.231 | Oct 2017 | - | | 1.231 | Continuing | Continuing | Continuing |
| Test Data Reduction Analysis | WR | NSWC : Corona, CA | 17.934 | 0.000 | | 1.334 | Feb 2017 | 1.541 | Oct 2017 | - | | 1.541 | Continuing | Continuing | Continuing |
| Test Support | WR | COMOPTEVFOR : Norfolk, VA | 12.607 | 0.000 | | 1.175 | Feb 2017 | 1.369 | Oct 2017 | - | | 1.369 | Continuing | Continuing | Continuing |
| Test/ACB Support | WR | NSWC : Dahlgren, VA | 2.290 | 0.000 | | 1.378 | Feb 2017 | 1.588 | Oct 2017 | - | | 1.588 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 75.507 | 0.000 | | 9.000 | | 11.000 | | - | | 11.000 | - | - | - |

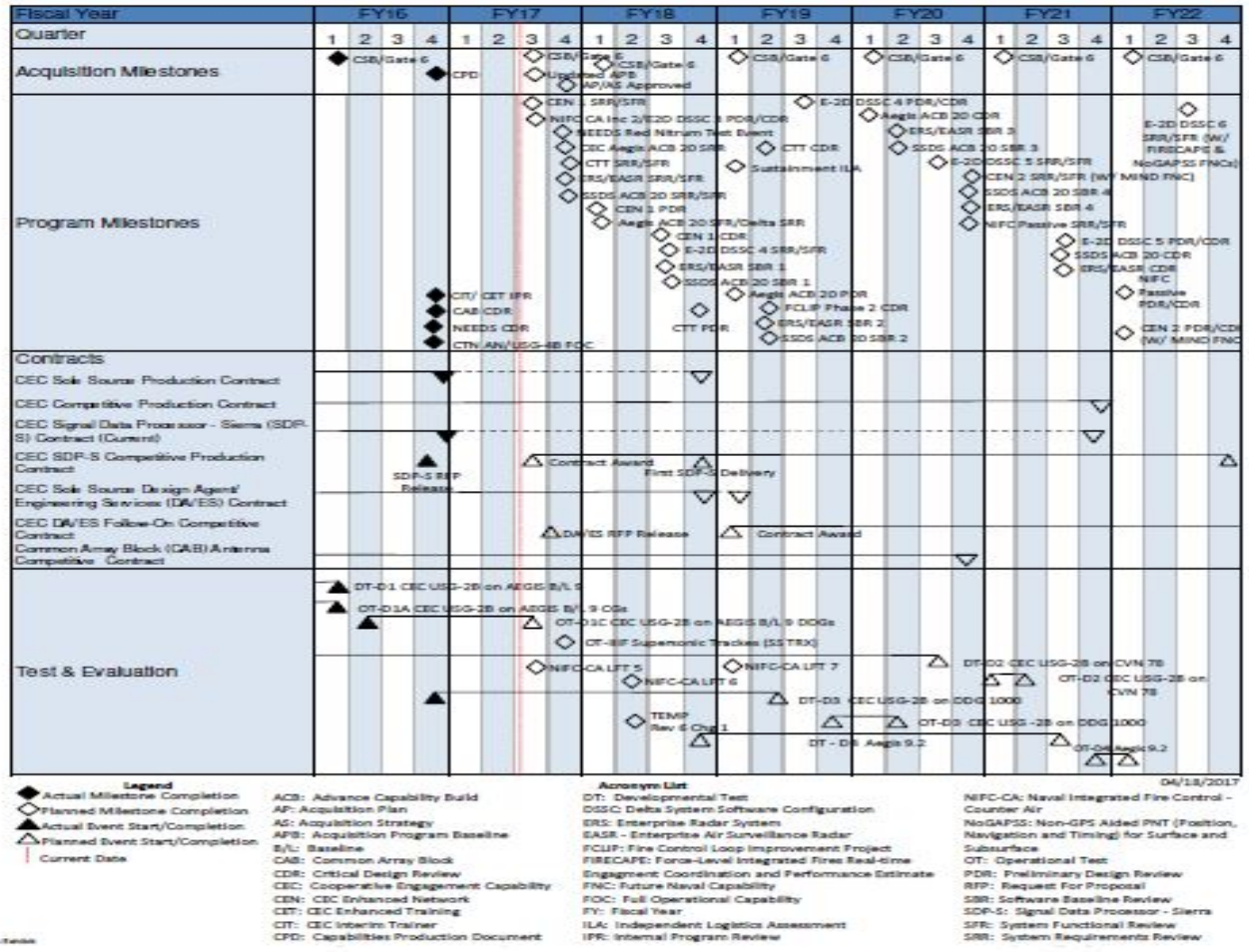
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | C/FFP | Booz Allen & Hamilton : Washington, DC | 5.070 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.070 | - |
| Program Management Support | C/FFP | Tech Marine : Washington, DC | 0.360 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.360 | - |
| | | **Subtotal** | 5.430 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.430 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 601.250 | 0.000 | | 84.501 | | 92.571 | | - | | 92.571 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2039*** | | | | |
| FY16 CSB/Gate 6 | 1 | 2016 | 1 | 2016 |
| FY17 CSB/Gate 6 | 1 | 2017 | 1 | 2017 |
| FY18 CSB/Gate 6 | 1 | 2018 | 1 | 2018 |
| FY19 CSB/Gate 6 | 1 | 2019 | 1 | 2019 |
| FY20 CSB/Gate 6 | 1 | 2020 | 1 | 2020 |
| FY21 CSB/Gate 6 | 1 | 2021 | 1 | 2021 |
| FY22 CSB/Gate 6 | 1 | 2022 | 1 | 2022 |
| CPD | 4 | 2016 | 4 | 2016 |
| Updated APB | 3 | 2017 | 3 | 2017 |
| AP/AS Approved | 4 | 2017 | 4 | 2017 |
| CEN 1 SRR/SFR | 3 | 2017 | 3 | 2017 |
| Sustainment ILA | 3 | 2018 | 3 | 2018 |
| NIFC-CA Inc 2/E2D DSSC 3 PDR/CDR | 3 | 2017 | 3 | 2017 |
| NEEDS Red Nitrium Test Event | 4 | 2017 | 4 | 2017 |
| CEC Aegis ACB 20 SRR | 4 | 2017 | 4 | 2017 |
| ERS/EASR SRR/SFR | 4 | 2017 | 4 | 2017 |
| CEN 1 PDR | 1 | 2018 | 1 | 2018 |
| Aegis ACB 20 SFR/Delta SRR | 1 | 2018 | 1 | 2018 |
| CEN 1 CDR | 3 | 2018 | 3 | 2018 |
| E-2D DSSC 4 SRR/SFR | 3 | 2018 | 3 | 2018 |
| ERS/EASR SBR 1 | 3 | 2018 | 3 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| SSDS ACB 20 SBR 1 | 3 | 2018 | 3 | 2018 |
| Aegis ACB 20 PDR | 1 | 2019 | 1 | 2019 |
| FCLIP Phase 2 CDR | 2 | 2019 | 2 | 2019 |
| ERS/EASR SBR 2 | 2 | 2019 | 2 | 2019 |
| SSDS ACB 20 SBR 2 | 2 | 2019 | 2 | 2019 |
| E-2D DSSC 4 PDR/CDR | 3 | 2019 | 3 | 2019 |
| Aegis ACB 20 CDR | 1 | 2020 | 1 | 2020 |
| ERS/EASR SBR 3 | 2 | 2020 | 2 | 2020 |
| SSDS ACB 20 SBR 3 | 2 | 2020 | 2 | 2020 |
| E-2D DSSC 5 SRR/SPR | 3 | 2020 | 3 | 2020 |
| CEN 2 SRR/SFR (W/MIND FNC) | 4 | 2020 | 4 | 2020 |
| SSDS ACB 20 SBR 4 | 4 | 2020 | 4 | 2020 |
| ERS/EASR SBR 4 | 4 | 2020 | 4 | 2020 |
| NIFC Passive SRR/SFR | 4 | 2020 | 4 | 2020 |
| E-2D DSSC 5 PDR/CDR | 3 | 2021 | 3 | 2021 |
| SSDS ACB 20 CDR | 3 | 2021 | 3 | 2021 |
| ERS/EASR CDR | 3 | 2021 | 3 | 2021 |
| NIFC Passive PDR/CDR | 1 | 2022 | 1 | 2022 |
| CEN 2 PDR/CDR (W/MIND FNC) | 1 | 2022 | 1 | 2022 |
| E-2D DSSC 6 SRR/SFR (W/FIRECAPE & NoGAPSS FNCs) | 3 | 2022 | 3 | 2022 |
| CIT/CET IPR | 4 | 2016 | 4 | 2016 |
| CAB CDR | 4 | 2016 | 4 | 2016 |
| NEEDS CDR | 4 | 2016 | 4 | 2016 |
| CTN AN/USG-4B FOC | 4 | 2016 | 4 | 2016 |
| CEC Sole Source Production Contract | 1 | 2016 | 4 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607658N / *(U)Cooperative Engagement Capability* | **Project (Number/Name)**<br>2039 / *COOP Engagement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| CEC Competitive Production Contract | 1 | 2016 | 4 | 2021 |
| CEC Signal Data Processor - Sierra (SDP-S) Contract (Current) | 1 | 2016 | 4 | 2021 |
| CEC SDP-S Competitive Production Contract | 3 | 2017 | 4 | 2022 |
| SDP-S RFP Release | 4 | 2016 | 4 | 2016 |
| First SDP-S Delivery | 4 | 2018 | 4 | 2018 |
| CEC Sole Source Design Agent/Engineering Services (DA/ES) Contract | 1 | 2016 | 1 | 2019 |
| CEC DA/ES Follow-On Competitive Contract | 1 | 2019 | 4 | 2022 |
| DA/ES RFP Release | 4 | 2017 | 4 | 2017 |
| Common Array Block (CAB) Antenna Competitive Contract | 1 | 2016 | 4 | 2020 |
| DT-D1 CEC USG-2B on AEGIS B/L9 | 1 | 2016 | 1 | 2016 |
| OT-D1A CEC USG-2B on AEGIS B/L 9 CGs | 1 | 2016 | 1 | 2016 |
| OT-D1C CEC USG-2B on AEGIS B/L 9 DDGs | 2 | 2016 | 3 | 2017 |
| OT-IIIF Supersonic Trackex (SS TRX) | 4 | 2017 | 4 | 2017 |
| NIFC-CA LFT 5 | 3 | 2017 | 3 | 2017 |
| NIFC-CA LFT 6 | 2 | 2018 | 2 | 2018 |
| NIFC-CA LFT 7 | 1 | 2019 | 1 | 2019 |
| DT-D2 CEC USG-2B on CVN 78 | 1 | 2016 | 3 | 2020 |
| DT-D3 CEC USG-2B on DDG 1000 | 4 | 2016 | 2 | 2019 |
| OT-D2 CEC USG-2B on CVN 78 | 1 | 2021 | 2 | 2021 |
| TEMP Rev 6 Chg 1 | 2 | 2018 | 2 | 2018 |
| OT-D3 CEC USG-2B on DDG 1000 | 4 | 2019 | 2 | 2020 |
| DT-D4 Aegis 9.2 | 4 | 2018 | 3 | 2021 |
| OT-D4 Aegis 9.2 | 4 | 2021 | 1 | 2022 |
| CIT/SRR/SFR | 4 | 2017 | 4 | 2017 |
| SSDS ACB 20 SRR/SFR | 4 | 2017 | 4 | 2017 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0607700N *I (U)Deployable Joint Command and Control* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 0.000 | 0.000 | 2.970 | 3.137 | - | 3.137 | 3.221 | 3.286 | 3.353 | 3.421 | Continuing | Continuing |
| 3050: *Deployable JT Command and Control* | 0.000 | 0.000 | 2.970 | 3.137 | - | 3.137 | 3.221 | 3.286 | 3.353 | 3.421 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

Deployable Joint Command and Control (DJC2) provides a self-contained, standardized, rapidly deployable, modular, scalable, and reconfigurable joint command and control (C2) capability to designated Geographic Combatant Commands (GCCs). DJC2 is the materiel solution to Defense Planning Guidance that called for the development of standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFC) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and JFCs a mission critical, integrated family of systems with which to plan, control, coordinate, execute, and assess operations. It is designed to deploy rapidly, set up within hours, and quickly provide necessary C2 mission and collaboration functionality across the full spectrum of JTF operations. The DJC2 has also been deployed in support of Humanitarian Assistance and Disaster Relief (HA/DR) efforts. The capability is intended for all levels of conflict and will be reconfigurable to meet specific GCC and JTF mission requirements. This capability is interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 2.970 | 3.160 | - | 3.160 |
| Current President's Budget | 0.000 | 2.970 | 3.137 | - | 3.137 |
| Total Adjustments | 0.000 | 0.000 | -0.023 | - | -0.023 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.023 | - | -0.023 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0607700N / *(U)Deployable Joint Command and Control* | Project (Number/Name)<br>3050 / *Deployable JT Command and Control* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3050: *Deployable JT Command and Control* | 0.000 | 0.000 | 2.970 | 3.137 | - | 3.137 | 3.221 | 3.286 | 3.353 | 3.421 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Deployable Joint Command and Control (DJC2) provides a self-contained, standardized, rapidly deployable, modular, scalable, and reconfigurable joint command and control (C2) capability to designated Geographic Combatant Commands (GCCs). DJC2 is the materiel solution to Defense Planning Guidance that called for the development of standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFC) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and JFCs a mission critical, integrated family of systems with which to plan, control, coordinate, execute, and assess operations. It is designed to deploy rapidly, set up within hours, and quickly provide necessary C2 mission and collaboration functionality across the full spectrum of JTF operations. The DJC2 has also been deployed in support of Humanitarian Assistance and Disaster Relief (HA/DR) efforts. The capability is intended for all levels of conflict and will be reconfigurable to meet specific GCC and JTF mission requirements. This capability is interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces. Note that DJC2 is not a follow-on or replacement system for the Joint Global Command and Control Systems (GCCS-J); rather, DJC2 employs a GCCS in its suite of applications, ensuring interoperability with the worldwide-installed base of GCCS-J.

FY18 funds development of efforts for systems engineering, integration, and DJC2 Test Bed. Focus areas include development efforts of emerging cyber security technologies.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Systems Engineering & Integration | 0.000 | 1.242 | 1.330 | 0.000 | 1.330 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Continue development efforts of emerging information assurance and cloud technologies as well as enhanced joint interoperability capabilities to meet warfighter needs. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607700N / *(U)Deployable Joint Command and Control* | **Project (Number/Name)**<br>3050 / *Deployable JT Command and Control* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue to develop system enhancements in support of Defense Information Systems Agency's Joint Information Environment (JIE) Tactical Processing Node(TPN) and Common Expeditionary and Shore Baseline (CESB) Enhancement as well as continue migration to a common infrastructure and C2ISR application baseline.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** DJC2 RDT&E Test Bed<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Test and demonstrate interoperability and enhanced cyber security capabilities. Continue to use DJC2 test bed for software testing and development of new capabilities.<br>***FY 2018 Base Plans:***<br>Continue testing and demonstration in support of Mission Partner Environment Information System (MPE IS) goals, Virtual Data Center (VDC) migration, Command and Control (C2) data access and exchange as well as Episodic Enclave capability - enabling dynamic enclave creation, use, and access.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 1.728<br>- | 1.807<br>- | 0.000<br>- | 1.807<br>- |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 2.970 | 3.137 | 0.000 | 3.137 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN /2804: *DJC2* | 1.314 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 162.717 |
| • OPN /2906: *DJC2* | 0.000 | 1.414 | 2.473 | - | 2.473 | 2.177 | 2.228 | 2.277 | 0.000 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

This RDT&E line supports an evolutionary acquisition strategy. The intent of this strategy is to: develop a system based upon a current understanding of joint requirements; rapidly field systems based upon those requirements; analyze operational utilization of the systems; and roll the results of the analysis into periodic

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0607700N / *(U)Deployable Joint Command and Control* | **Project (Number/Name)**<br>3050 / *Deployable JT Command and Control* |

upgrades of the systems to maintain currency and maximize operational effectiveness. The baseline configuration is based upon existing Command, Control, Communications, Computers, & Intelligence (C4I) systems, scaled to the Combatant Command level. The follow-on configurations will include newly developed capabilities based on emergent, joint requirements and operational feedback based upon utilization of earlier delivered systems.

**E. Performance Metrics**

The Deployable Joint Command and Control (DJC2) program continues to identify, evaluate and test a minimum of 3 - 5 new technologies per year based on emergent / joint requirements for potential insertion into the DJC2 system upgrade plan.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0101221N *I Strategic Sub & Wpns Sys Supt* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 966.226 | 96.078 | 136.556 | 135.219 | - | 135.219 | 88.170 | 56.005 | 45.522 | 24.976 | Continuing | Continuing |
| 0951: *Joint Warhead Fuze Sustainment Program* | 298.817 | 93.440 | 111.857 | 109.730 | - | 109.730 | 64.610 | 32.348 | 21.473 | 0.000 | 0.000 | 732.275 |
| 2021: *Mk4A Shape Stable Nose Tip* | 0.000 | 0.000 | 0.000 | 6.000 | - | 6.000 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |
| 2228: *Technical Applications Programs* | 643.469 | 0.000 | 22.123 | 16.695 | - | 16.695 | 14.716 | 14.771 | 15.097 | 15.964 | Continuing | Continuing |
| 3158: *Integrated Nuclear Weapons Security Sys Dev* | 23.940 | 2.638 | 2.576 | 2.794 | - | 2.794 | 2.844 | 2.886 | 2.952 | 3.012 | Continuing | Continuing |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 178 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The Joint Warhead Fuze Sustainment Program (0951) is an effort to develop advanced components to improve the reliability, safety, and security of Arming, Fuzing and Firing (AF&F) systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.

The Mk4A Shape Stable Nose Tip (SSNT) (2021) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of NNSA Office of Secure Transportation (OST) for shipping.

The Technology Applications Program (2228) supports the TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) that provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable, sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. The MEP project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem, allowing for in-flight correction, the potential to operate in environments where GPS is denied, and may provide future relief to the strict tolerance requirements of the strategic navigator on the current OHIO class submarines and the OHIO Class Replacement program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across

the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications.

The Integrated Nuclear Weapons Security System (INWSS) (3158) efforts support the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay, or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The Chief of Naval Operations (CNO) has assigned the Strategic Systems Programs (SSP), the FBM program manager, with mission responsibility for the safeguard of FBM nuclear technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies. These efforts will improve countermeasure technologies to address detection, delay and denial.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 96.404 | 136.556 | 128.286 | - | 128.286 |
| Current President's Budget | 96.078 | 136.556 | 135.219 | - | 135.219 |
| Total Adjustments | -0.326 | 0.000 | 6.933 | - | 6.933 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.000 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.325 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 6.000 | - | 6.000 |
| • Rate/Misc Adjustments | -0.001 | 0.000 | 0.933 | - | 0.933 |

**Change Summary Explanation**

Funding increased in FY 2018 for the Shape Stable Nose Tip (SSNT) ($6M) and rate adjustments.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>0951 / *Joint Warhead Fuze Sustainment Program* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0951: *Joint Warhead Fuze Sustainment Program* | 298.817 | 93.440 | 111.857 | 109.730 | - | 109.730 | 64.610 | 32.348 | 21.473 | 0.000 | 0.000 | 732.275 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 178

**A. Mission Description and Budget Item Justification**

The Joint Warhead Fuze Sustainment Program is an effort to develop advanced components to improve the reliability, safety, and security of AF&F systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TRIDENT II | 93.440 | 111.857 | 109.730 | 0.000 | 109.730 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs<br>Support engineer working groups and program reviews.<br>Continue AF&F sub-assembly design demonstrations<br>Continue development of advanced safety and surety architecture solutions.<br>Continue detailed design<br>Continue to develop and implement software changes due to AF&F<br>Conduct performance assessment of tested designs<br>Conduct production engineering<br>Begin missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis<br>Design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers | | | | | |
| ***FY 2017 Plans:***<br>Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs<br>Support engineer working groups and program reviews.<br>Continue AF&F sub-assembly design demonstrations | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>0951 / *Joint Warhead Fuze Sustainment Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue development of advanced safety and surety architecture solutions.<br>Continue detailed design<br>Continue to develop and implement software changes due to AF&F<br>Conduct performance assessment of tested designs<br>Conduct production engineering<br>Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis<br>Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers<br>Flight Test and integration<br>Conduct FCET 53 flight experiment system test and integration, drawing & procedure updates, and SPALT proofing<br>Begin Production Proof In (PPI) builds | | | | | |
| ***FY 2018 Base Plans:***<br>Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs<br>Support engineer working groups and program reviews.<br>Continue AF&F sub-assembly design demonstrations<br>Continue development of advanced safety and surety architecture solutions.<br>Continue detailed design<br>Continue to develop and implement software changes due to AF&F<br>Conduct performance assessment of tested designs<br>Conduct production engineering<br>Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis<br>Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers<br>Flight Test and integration<br>Continue Production Proof In (PPI) builds<br>Conduct system vulnerability analysis<br>Engineering support for Electromagnetic Environment testing and data analysis<br>Conduct concept and design reviews<br>Conduct telemetry analysis<br>Conduct Thermal Battery Evaluations and Certifications<br>Procurement of developmental hardware | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>0951 / *Joint Warhead Fuze Sustainment Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Qualification of developmental hardware | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 93.440 | 111.857 | 109.730 | 0.000 | 109.730 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTEN/3219: *SBSD Nuclear Technology Development* | 419.273 | 390.326 | 265.462 | - | 265.462 | 190.107 | 114.010 | 80.088 | 60.144 | Continuing | Continuing |
| • RDTEN/3220: *Advanced Submarine System Development* | 947.783 | 700.811 | 776.157 | - | 776.157 | 514.520 | 447.447 | 326.007 | 208.311 | Continuing | Continuing |
| • OPN/5358: *SWS Modernization Funds* | 240.677 | 215.138 | 246.221 | - | 246.221 | 275.485 | 278.260 | 245.166 | 258.037 | 0.000 | 2,720.405 |
| • WPN/1250: *TRIDENT II Mods* | 1,089.064 | 1,103.086 | 1,143.595 | - | 1,143.595 | 1,110.469 | 1,210.406 | 1,253.015 | 1,247.250 | 4,009.553 | 24,493.593 |
| • OMN/1D2D: *Fleet Ballistic Missile* | 1,033.209 | 1,030.868 | 1,056.858 | - | 1,056.858 | 1,141.919 | 1,169.087 | 1,182.438 | 1,212.984 | 0.000 | 7,827.363 |
| • SCN/1045: *OHIO Replacement Submarine* | 0.000 | 773.138 | 867.853 | - | 867.853 | 2,999.236 | 1,473.898 | 4,237.852 | 4,260.920 | 95,064.200 | 109,677.097 |

**Remarks**

**D. Acquisition Strategy**

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

**E. Performance Metrics**

Not applicable

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>0951 / *Joint Warhead Fuze Sustainment Program* | |

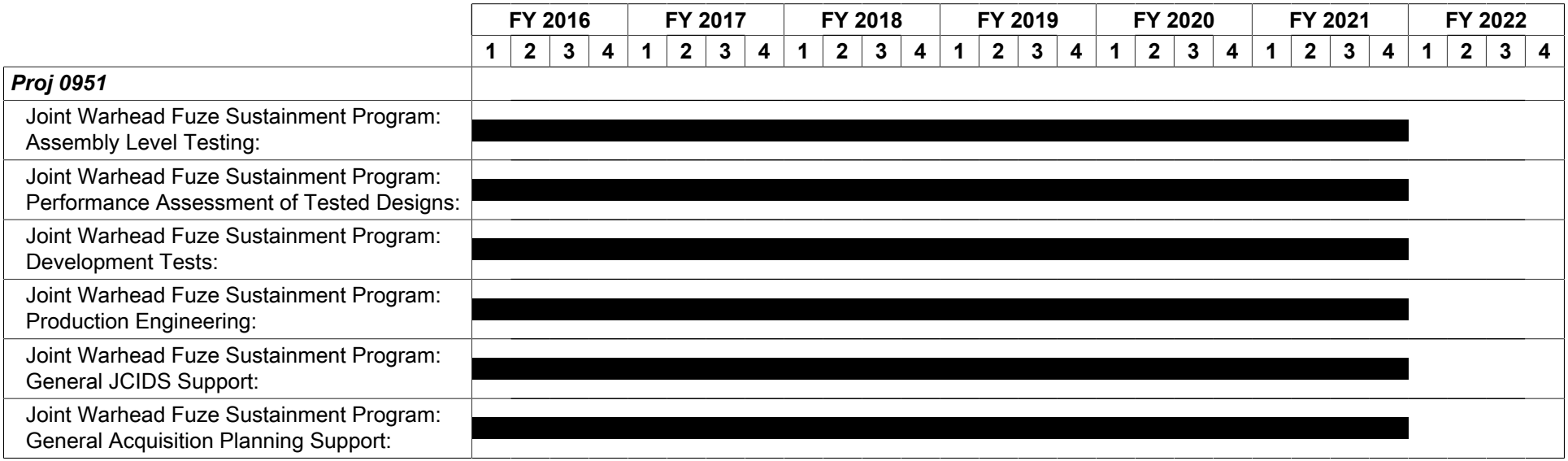
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Joint Warhead Fuze Sustainment DOE | MIPR | DOE : NM | 253.046 | 71.282 | Nov 2015 | 91.257 | Dec 2016 | 92.466 | Nov 2017 | - | | 92.466 | 0.000 | 508.051 | Continuing |
| Joint Warhead Fuze Sustainment ITT | SS/CPFF | ITT : VA | 10.907 | 4.000 | Oct 2015 | 4.000 | Nov 2016 | 4.265 | Nov 2017 | - | | 4.265 | 0.000 | 23.172 | Continuing |
| Joint Warhead Fuze Sustainment LMMS | SS/CPFF | LMMS : CA | 23.185 | 11.702 | Nov 2015 | 11.930 | Nov 2016 | 11.793 | Nov 2017 | - | | 11.793 | 0.000 | 58.610 | Continuing |
| Joint Warhead Fuze Sustainment | WR | NSWC Dahlgren : VA | 10.863 | 5.278 | Dec 2015 | 2.465 | Dec 2016 | 0.318 | Oct 2017 | - | | 0.318 | 0.000 | 18.924 | Continuing |
| Joint Warhead Fuze Sustainment | SS/CPFF | BAE : MD | 0.438 | 0.291 | Nov 2015 | 0.505 | Dec 2016 | 0.505 | Dec 2017 | - | | 0.505 | 0.000 | 1.739 | Continuing |
| Joint Warhead Fuze Sustainment | SS/CPIF | APL : MD | 0.348 | 0.437 | Dec 2015 | 0.000 | | 0.144 | Dec 2017 | - | | 0.144 | 0.000 | 0.929 | Continuing |
| Joint Warhead Fuze Sustainment | C/BA | GDAIS : MA | 0.030 | 0.150 | Dec 2015 | 1.500 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.680 | Continuing |
| Joint Warhead Fuze Sustainment | WR | CNSW : ID | 0.000 | 0.200 | Nov 2015 | 0.200 | Oct 2016 | 0.239 | Oct 2017 | - | | 0.239 | 0.000 | 0.639 | Continuing |
| Joint Warhead Fuze Sustainment | WR | NCCC : Not Specified | 0.000 | 0.100 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.100 | Continuing |
| | | **Subtotal** | 298.817 | 93.440 | | 111.857 | | 109.730 | | - | | 109.730 | 0.000 | 613.844 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 298.817 | 93.440 | | 111.857 | | 109.730 | | - | | 109.730 | 0.000 | 613.844 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>0951 / *Joint Warhead Fuze Sustainment Program* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>0951 / *Joint Warhead Fuze Sustainment Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0951*** | | | | |
| Joint Warhead Fuze Sustainment Program: Assembly Level Testing: | 1 | 2016 | 4 | 2021 |
| Joint Warhead Fuze Sustainment Program: Performance Assessment of Tested Designs: | 1 | 2016 | 4 | 2021 |
| Joint Warhead Fuze Sustainment Program: Development Tests: | 1 | 2016 | 4 | 2021 |
| Joint Warhead Fuze Sustainment Program: Production Engineering: | 1 | 2016 | 4 | 2021 |
| Joint Warhead Fuze Sustainment Program: General JCIDS Support: | 1 | 2016 | 4 | 2021 |
| Joint Warhead Fuze Sustainment Program: General Acquisition Planning Support: | 1 | 2016 | 4 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>2021 / *Mk4A Shape Stable Nose Tip* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021: *Mk4A Shape Stable Nose Tip* | 0.000 | 0.000 | 0.000 | 6.000 | - | 6.000 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 178

**A. Mission Description and Budget Item Justification**

The Mk4A Shape Stable Nose Tip (SSNT) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of NNSA Office of Secure Transportation (OST) for shipping.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Mk4A Shape Stable Nose Tip | 0.000 | 0.000 | 6.000 | 0.000 | 6.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Not Applicable | | | | | |
| ***FY 2017 Plans:***<br>Not Applicable | | | | | |
| ***FY 2018 Base Plans:***<br>Strategic Systems Programs Alteration (SPALT) documentation<br>Analyze & review reentry body (RB) aerodynamics data for future Fire Control updates<br>Scaling laboratory conversion process of RB Forward Shell Assemblies (FSA's) to accept shape stable nose tips (SSNT's) in to a production environment<br>Procure development nose tip billet material units to support material qualification testing | | | | | |
| ***FY 2018 OCO Plans:***<br>Not Applicable | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 6.000 | 0.000 | 6.000 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2021 / *Mk4A Shape Stable Nose Tip* |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2021 / *Mk4A Shape Stable Nose Tip* |

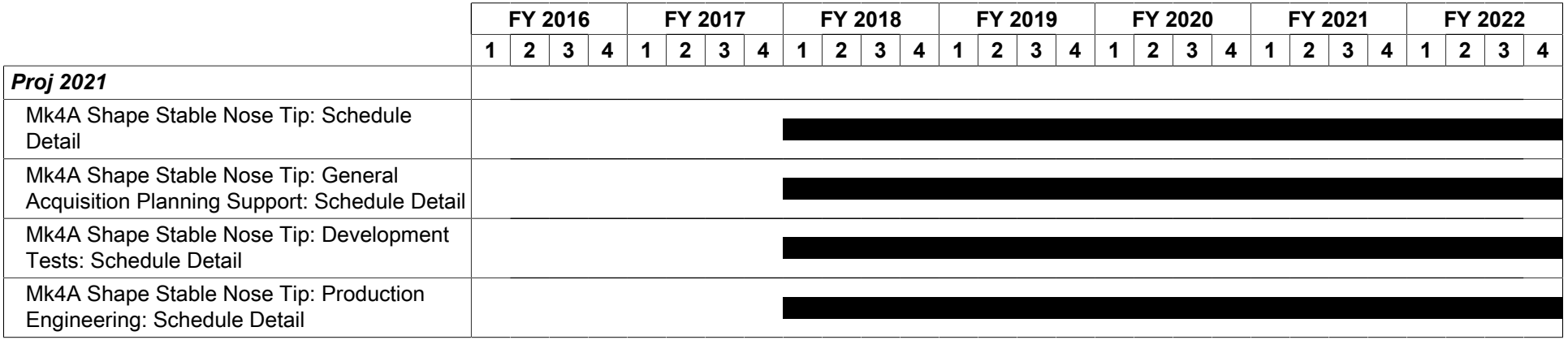
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSNT LMSS | TBD | LMSS : CA | 0.000 | 0.000 | | 0.000 | | 5.000 | Apr 2018 | - | | 5.000 | Continuing | Continuing | Continuing |
| SSNT NSWC | TBD | NSWC : VA | 0.000 | 0.000 | | 0.000 | | 1.000 | Apr 2018 | - | | 1.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 6.000 | | - | | 6.000 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 6.000 | | - | | 6.000 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2021 / *Mk4A Shape Stable Nose Tip* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2021 / *Mk4A Shape Stable Nose Tip* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2021*** | | | | |
| Mk4A Shape Stable Nose Tip: Schedule Detail | 1 | 2018 | 4 | 2022 |
| Mk4A Shape Stable Nose Tip: General Acquisition Planning Support: Schedule Detail | 1 | 2018 | 4 | 2022 |
| Mk4A Shape Stable Nose Tip: Development Tests: Schedule Detail | 1 | 2018 | 4 | 2022 |
| Mk4A Shape Stable Nose Tip: Production Engineering: Schedule Detail | 1 | 2018 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>2228 / *Technical Applications Programs* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2228: *Technical Applications Programs* | 643.469 | 0.000 | 22.123 | 16.695 | - | 16.695 | 14.716 | 14.771 | 15.097 | 15.964 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Multi-Star Enhanced Prelaunch (MEP) project was originally scheduled to commence in FY 2016. The MEP project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem, allowing for in-flight correction, the potential to operate in environments where GPS is denied, and potential future relief to the strict tolerance requirements of the strategic navigator on the current OHIO class submarines and the OHIO Class Replacement program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Multi-Star Enhanced Prelaunch (MEP) | 0.000 | 8.757 | 13.030 | 0.000 | 13.030 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Began software engineering development<br>Design Conformance Review<br>Integration Testing<br>Hardware in the Loop Testing<br>Independent Verification and Validation Testing<br>Guidance Demonstration and Shakedown Operation (DASO) Special Test Support<br>Fire Control and Navigation DASO Software Development | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2228 / *Technical Applications Programs* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| MEP DASO 30 Critical Design Review<br>DASO 30 Hardware in the Loop Testing<br>Fire Control DASO 30 Software Integrated Baseline Development<br>Navigation DASO 30 Software Integration Build Development<br>Guidance DASO 30 Software Independent Verification and Validation Testing<br>DASO 30 SWS Subsystem Integrated Testing and Analysis<br>DASO 30 Interface Coordination Documentation finalized<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** System Engineering Modeling and Simulation | 0.000 | 13.366 | 3.665 | 0.000 | 3.665 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Begin to develop model based design integration plan.<br>Begin modeling and simulation gap analysis.<br>Begin assessment on RadHard avionics and electronics technology and affordability.<br>Begin assessment on propellant technologies.<br>Begin assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved mission flexibility and affordability.<br>Begin assessment of common serial bus architectures for future flexibility and commonality between the Navy and other services.<br>Begin assessment of common Fire Control/Ground architectures and software to support USSTRATCOM targeting requirements. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue develop model based design integration plan.<br>Continue modeling and simulation gap analysis.<br>Continue assessment on RadHard avionics and electronics technology and affordability.<br>Continue assessment on propellant technologies. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2228 / *Technical Applications Programs* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved mission flexibility and affordability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 22.123 | 16.695 | 0.000 | 16.695 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Contracts will continue to be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

**E. Performance Metrics**

Not applicable

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>2228 / *Technical Applications Programs* | |

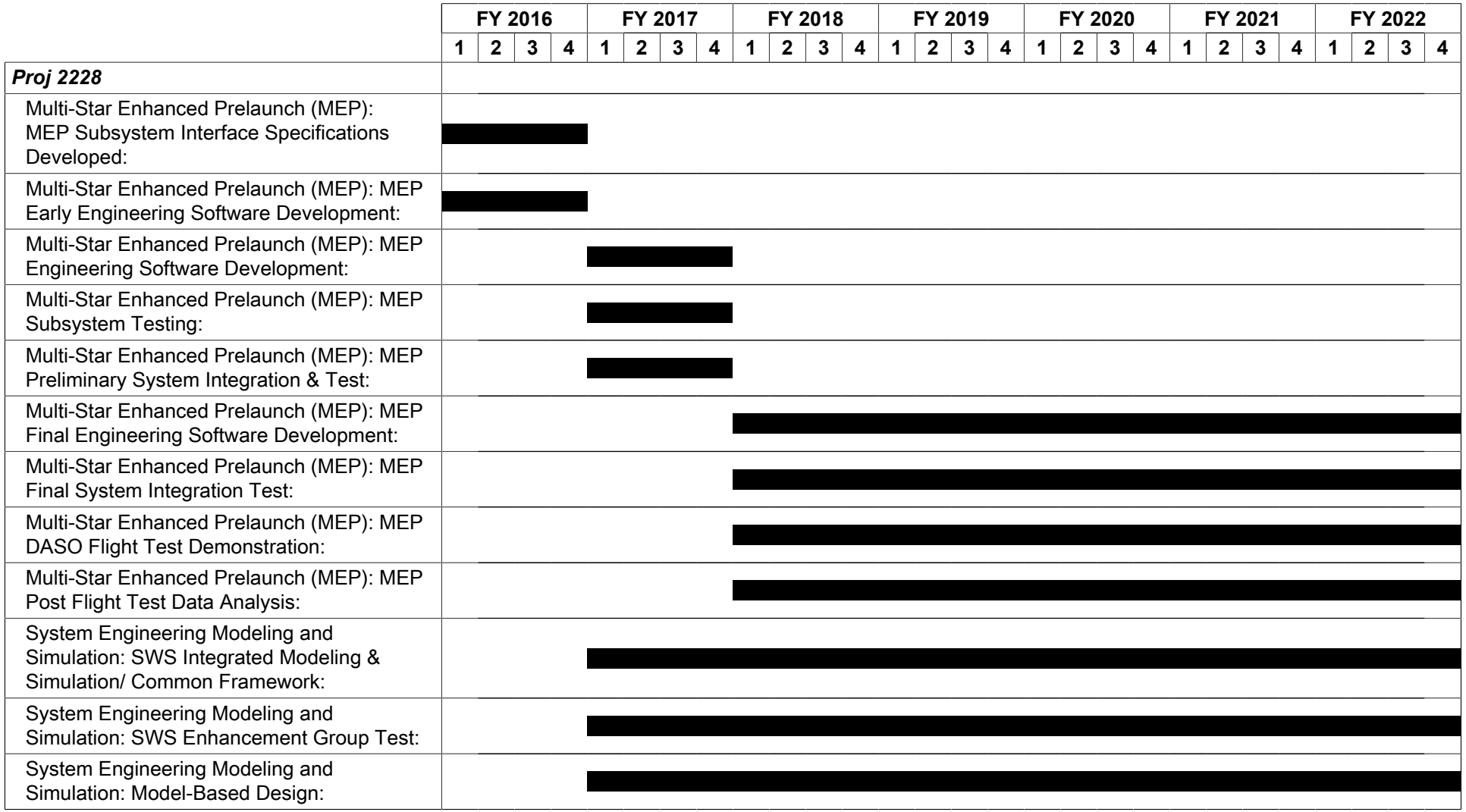
**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technology Applications LMSS | SS/CPFF | LMSS : CA | 160.450 | 0.000 | | 3.822 | May 2017 | 1.000 | Oct 2017 | - | | 1.000 | Continuing | Continuing | Continuing |
| Technology Applications NSWC | WR | NSWC : VA | 93.474 | 0.000 | | 0.844 | May 2017 | 0.300 | Oct 2017 | - | | 0.300 | 0.000 | 94.618 | - |
| Technology Applications DOE | MIPR | DOE : NM | 33.717 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 33.717 | - |
| Technology Applications ITT | SS/CPFF | ITT : CO | 12.194 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 12.194 | - |
| Technology Applications CSDL | SS/CPFF | CSDL : MA | 322.249 | 0.000 | | 17.457 | May 2017 | 13.750 | Oct 2017 | - | | 13.750 | 0.000 | 353.456 | - |
| Technology Applications AERO | SS/CPFF | AERO : CA | 3.068 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.068 | - |
| Technology Applications VAR | Various | Various : Various | 18.317 | 0.000 | | 0.000 | | 1.345 | Oct 2017 | - | | 1.345 | 0.000 | 19.662 | - |
| Technology Applications GD-AIS | SS/CPFF | GDMS : MA | 0.000 | 0.000 | | 0.000 | | 0.300 | Oct 2017 | - | | 0.300 | 0.000 | 0.300 | - |
| | | **Subtotal** | 643.469 | 0.000 | | 22.123 | | 16.695 | | - | | 16.695 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 643.469 | 0.000 | | 22.123 | | 16.695 | | - | | 16.695 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2228 / *Technical Applications Programs* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>2228 / *Technical Applications Programs* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2228*** | | | | |
| Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Interface Specifications Developed: | 1 | 2016 | 4 | 2016 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Early Engineering Software Development: | 1 | 2016 | 4 | 2016 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Engineering Software Development: | 1 | 2017 | 4 | 2017 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Testing: | 1 | 2017 | 4 | 2017 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Preliminary System Integration & Test: | 1 | 2017 | 4 | 2017 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Final Engineering Software Development: | 1 | 2018 | 4 | 2022 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Final System Integration Test: | 1 | 2018 | 4 | 2022 |
| Multi-Star Enhanced Prelaunch (MEP): MEP DASO Flight Test Demonstration: | 1 | 2018 | 4 | 2022 |
| Multi-Star Enhanced Prelaunch (MEP): MEP Post Flight Test Data Analysis: | 1 | 2018 | 4 | 2022 |
| System Engineering Modeling and Simulation: SWS Integrated Modeling & Simulation/ Common Framework: | 1 | 2017 | 4 | 2022 |
| System Engineering Modeling and Simulation: SWS Enhancement Group Test: | 1 | 2017 | 4 | 2022 |
| System Engineering Modeling and Simulation: Model-Based Design: | 1 | 2017 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | Project (Number/Name)<br>3158 / *Integrated Nuclear Weapons Security Sys Dev* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3158: *Integrated Nuclear Weapons Security Sys Dev* | 23.940 | 2.638 | 2.576 | 2.794 | - | 2.794 | 2.844 | 2.886 | 2.952 | 3.012 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Enhanced Special Weapons effort supports the Nuclear Weapons Security (NWS) program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The CNO has assigned SSP, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear assets. More specifically, the mission includes landside and pier operations as well as transits to and from the dive point, each of which present challenges to personnel as well as existing technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies focusing on land and in transit requirements. Collectively, these efforts will improve countermeasure technologies addressing detection, delay and denial.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Integrated Nuclear Weapons Security Sys Dev | 2.638 | 2.576 | 2.794 | 0.000 | 2.794 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Waterside Detection System (WDS) Upstream Data Fusion: Development of software and hardware to fuse low level sensor data from multiple WDS sensors to increase capability for tracking and classification of current sensors.<br>NWS Technology Refresh: Development of technologies for refresh of electronic security systems for the Limited Area and Electronic Harbor Security System in the Waterfront Restricted Area (WRA). This includes electronic hardware and algorithms.<br>Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain.<br>FOPEN Sensor Transition: OSD(NM) is funding evaluation and demonstration of a variety of FOPEN Sensors. This effort will fund on site demonstration as well as necessary transition planning and development to facilitate transition of down selected sensors for incorporation into NWS POR. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>3158 / *Integrated Nuclear Weapons Security Sys Dev* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial.<br>***FY 2017 Plans:***<br>Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain.<br>Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial.<br>Conduct Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition<br>***FY 2018 Base Plans:***<br>Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain.<br>Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial.<br>Continue Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.638 | 2.576 | 2.794 | 0.000 | 2.794 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/Various-2: *OPN (Nuclear Weapons Security)* | 33.253 | 38.410 | 28.513 | - | 28.513 | 30.259 | 42.457 | 34.878 | 35.575 | Continuing | Continuing |
| • OMN/11D2D-3: *Fleet Ballistic Missile (Nuclear Weapons Security)* | 75.017 | 76.415 | 89.091 | - | 89.091 | 82.253 | 83.621 | 85.257 | 86.931 | Continuing | Continuing |
| • OMN/11D2D-5: *Fleet Ballistic Missile (Transit/Escort)* | 95.387 | 110.770 | 90.689 | - | 90.689 | 91.389 | 93.396 | 95.200 | 97.147 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101221N / *Strategic Sub & Wpns Sys Supt* | **Project (Number/Name)**<br>3158 / *Integrated Nuclear Weapons Security Sys Dev* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • MCN/Various-1: *MILCON (CNI) (Nuclear Weapons Security)* | 77.709 | 47.119 | 0.000 | - | 0.000 | 89.393 | 19.327 | 72.160 | 21.766 | 0.000 | 391.954 |
| • WPN/4129/0101228N: *Small Arms* | 2.300 | 7.007 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.307 |

**Remarks**

**D. Acquisition Strategy**

Procurements are being executed through a combination of private contractors (large and small business), government Centers of Excellence (COEs), other government agencies and the Naval Submarine Bases, Kitsap and Kings Bay. Contract awards are based upon "best value" determinations, and where practical will be performance based or include incentive provisions.

**E. Performance Metrics**

Not applicable

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0101224N *I SSBN Security Tech Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 45.166 | 33.845 | 36.242 | - | 36.242 | 37.163 | 37.953 | 38.727 | 39.501 | Continuing | Continuing |
| 0092: *SSBN Security* | 0.000 | 45.166 | 33.845 | 36.242 | - | 36.242 | 37.163 | 37.953 | 38.727 | 39.501 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 46.481 | 33.845 | 36.442 | - | 36.442 |
| Current President's Budget | 45.166 | 33.845 | 36.242 | - | 36.242 |
| Total Adjustments | -1.315 | 0.000 | -0.200 | - | -0.200 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.315 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.200 | - | -0.200 |

**Change Summary Explanation**

Technical: Not applicable.
Schedule: Not applicable.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0101226N *I Submarine Acoustic War Dev* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 38.057 | 4.658 | 9.329 | 12.053 | - | 12.053 | 9.330 | 9.430 | 13.583 | 13.856 | Continuing | Continuing |
| 1265: *Sub Defensive Warfare* | 38.057 | 3.886 | 9.329 | 12.053 | - | 12.053 | 9.330 | 9.430 | 13.583 | 13.856 | Continuing | Continuing |
| 9999: *Congressional Adds* | 0.000 | 0.772 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.772 |

**A. Mission Description and Budget Item Justification**

The Submarine Acoustic Warfare Development program element is comprised of the Submarine Defensive Warfare Program and a Congressional ADD for Compact Rapid Attack Weapon Program (CRAW). The objective is to maintain and improve the survivability of all U.S. submarine classes in response to torpedo attack. Efforts include the Next Generation Countermeasure (NGCM) program, the Torpedo Defense Working Group (TDWG), Technical Direction Agent (TDA) and In-Service Engineering Agent (ISEA) hardware and software development support for Acoustic Devices Countermeasures (ADCs), Countermeasures Set, Acoustic (CSA) systems and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion. Also, this program transitions the research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives.

Project 9999/Congressional Add for Compact Rapid Attack Weapon Program (CRAW) will identify the program requirements for a CRAW Program, to determine and justify a new start program based on employing the 6" diameter Countermeasure Anti-Torpedo (CAT) in the submarine force.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.700 | 9.329 | 12.100 | - | 12.100 |
| Current President's Budget | 4.658 | 9.329 | 12.053 | - | 12.053 |
| Total Adjustments | -0.042 | 0.000 | -0.047 | - | -0.047 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.042 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.047 | - | -0.047 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2016 | FY 2017 |
|---|---|---|
| **Project:** 9999: *Congressional Adds* | | |
| Congressional Add: *Combat Rapid Attach Weapon Program* | 0.772 | 0.000 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0101226N *I Submarine Acoustic War Dev* |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2016 | FY 2017 |
|---|---|---|
| Congressional Add Subtotals for Project: 9999 | 0.772 | 0.000 |
| Congressional Add Totals for all Projects | 0.772 | 0.000 |

**Change Summary Explanation**

Schedule: The developmental efforts will include torpedo threat analysis and integration, Concept of Operations (CONOPS) for fleet tactics evaluation, Test and Evaluation Master Plan (TEMP) completion, Tactical Decision Aid (TacDA) development, and sabot development for External Countermeasure Launcher (ECL) capability. A single, new development contract resulting in fully functional EDM device variants will be awarded in FY18. The developmental contract will consist of a 4 year development effort and the 5th year will provide Low-Rate Initial Production (LRIP) units for accomplishing operational testing (OT) in FY22-23. Milestone C is notionally planned for FY22.

Financial:
FY 2016 $0.042 million was decreased for SBIR adjustment.
FY 2018 $7.000 million to be awarded for the base year of a 5 year developmental contract.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101226N / *Submarine Acoustic War Dev* | Project (Number/Name)<br>1265 / *Sub Defensive Warfare* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1265: *Sub Defensive Warfare* | 38.057 | 3.886 | 9.329 | 12.053 | - | 12.053 | 9.330 | 9.430 | 13.583 | 13.856 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The increase in FY18 funding is primarily due to the efforts required during the base year of the development contract (1Q FY18 Award), which includes Non-Recurring Engineering (NRE) for the initial design development, feasibility analysis and the design of three Engineering Development Model (EDM) variants, that will be used to begin the government's Developmental Testing (DT). Hardware deliveries of the initial EDM variants will begin, and the Critical Design Review (CDR) will be accomplished in 2018. Governmental design of the Sabot will culminate in a Critical Design Review late in FY18.

This project supports the Submarine Acoustic Warfare System (SAWS) program to maintain and improve the survivability of all U.S. submarine classes in response to torpedo attack. This program funds:

1. The Next Generation Countermeasure (NGCM) program, (ACAT III) currently in Engineering and Manufacturing Development (E&MD). The ADC MK5 Device Developmental Contract will be awarded in FY18, through a full and open competition, Cost Plus Incentive Fee (CPIF) contract, and government development in SABOT and Tactical Decision Aid development. The key new capabilities NGCM brings are: adaptive countermeasure (ACM) technology with full duplex capability and mobility packaged in a three inch diameter body. Milestone C is nominally 2022.

2. The Torpedo Defense Working Group (TDWG). A working group comprised of fleet, resource sponsor, and acquisition community representatives to assess countermeasure effectiveness against fleet threats, both known and projected, with associated studies, models, and simulations.

3. The Technical Direction Agent (TDA) and In-Service Engineering Agent (ISEA) hardware and software development support for Acoustic Devices Countermeasure (ADC) (ADC MK 2, 3 & 4, NAE Beacon) as well as Countermeasures Set, Acoustic (CSA) MK 2, MK 3, MK 4 systems and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion.

4. Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and impact on improving submarine survivability. The technology is then incorporated into the appropriate countermeasure.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Sub Acoustic Warfare | 3.886 | 9.329 | 12.053 | 0.000 | 12.053 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>- Continue NGCM TEMP<br>- Continue preparing for the NGCM developmental contract.<br>- Continue M&S for known and projected torpedo threats<br>- Continue development of required program documentation<br>- Continue development of CONOPS and TacDA for fleet tactics<br>- Continue sabot development for external launch<br>- Conduct review TDWG and WAF with updated reliability assessments.<br>***FY 2017 Plans:***<br>- Complete NGCM TEMP<br>- Continue M&S for known and projected torpedo threats<br>- Continue development of required program documentation<br>- Continue development of CONOPS and TacDA for fleet tactics<br>- Continue sabot development for external launch<br>- Continue assessment of threat by TDWG and WAF with updated vulnerability assessments<br>***FY 2018 Base Plans:***<br>- Begin NGCM Engineering and Manufacturing Development Phase under development contract.<br>- Award NGCM Development Contract.<br>- Begin first three EDM variant designs<br>- NGCM Critical Design Reviews<br>- Continue M&S for known and projected torpedo threats<br>- Continue development of required program documentation<br>- Continue development of CONOPS and TacDA for fleet tactics<br>- Continue sabot development for external launch<br>- Sabot Critical Design Review<br>- Continue assessment of threat by TDWG and WAF with updated vulnerability assessments<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.886 | 9.329 | 12.053 | 0.000 | 12.053 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2210: *Submarine Acoustic Warfare System* | 19.718 | 21.291 | 21.449 | - | 21.449 | 24.090 | 26.218 | 26.738 | 27.272 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Submarine Acoustic Warfare System (SAWS) develops Undersea Defensive Warfare technologies to improve the survivability of all U.S. Submarine classes. The integration of technology into the Next Generation Countermeasure (NGCM) and the NGCM-capable CSA MK 3/4 system will continue through FY23. The NGCM development contract will be awarded in FY 18, through a full and open competition, Cost Plus Incentive Fee (CPIF) contract. Engineering Development Model (EDM) variants, Technical Data Packages (TDP), and LRIP units for accomplishing Operational Testing, will be delivered to the Navy under this contract. NGCM contractor subsystem testing will occur in FY 18 through FY 22 and joint contractor/Navy Developmental Testing (DT) will be in FY 19 through FY 21, with Navy Operational Testing (OT) in FY 22 through FY 23. Milestone C is nominally in FY 22. Initial Operational Capability (IOC) is nominally FY 24 for both the Internal Countermeasure Launcher (ICL) and External Countermeasure Launcher (ECL)capability of NGCM. The production contract solicitation will be issued in FY23, after successfully completing OT and Full Rate Production decision review (FRP DR) approval, for an award in FY23, as a full and open competition, build to print approach with either a single producer or leader/follower production contract.

**E. Performance Metrics**

Progress Reviews
Execution Reporting and Reviews
Milestone Reviews

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WAF ANALYSIS TDWG | WR | NUWC : NEWPORT, RI | 11.553 | 0.261 | Dec 2015 | 0.700 | Dec 2016 | 0.275 | Dec 2017 | - | | 0.275 | Continuing | Continuing | Continuing |
| NGCM SYSYTEM ENGINEERING | WR | NUWC : NEWPORT, RI | 9.340 | 0.600 | Dec 2015 | 1.700 | Dec 2016 | 0.666 | Dec 2017 | - | | 0.666 | Continuing | Continuing | Continuing |
| NGCM New Development | C/CPIF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 7.000 | Dec 2017 | - | | 7.000 | Continuing | Continuing | Continuing |
| CSA MK5 SYSTEM ENGINEERING | WR | NUWC : KEYPORT, WA | 1.495 | 0.500 | Dec 2015 | 1.549 | Dec 2016 | 0.700 | Dec 2017 | - | | 0.700 | Continuing | Continuing | Continuing |
| Modeling And Simulation | WR | NUWC : NEWPORT, RI | 1.437 | 1.225 | Dec 2015 | 2.000 | Dec 2016 | 1.132 | Dec 2017 | - | | 1.132 | Continuing | Continuing | Continuing |
| Tactical Decision Aid | WR | NUWC : NEWPORT, RI | 0.000 | 0.600 | Dec 2015 | 1.800 | Dec 2016 | 1.100 | Dec 2017 | - | | 1.100 | Continuing | Continuing | Continuing |
| Sabot Development | WR | NUWC : NEWPORT, RI | 0.479 | 0.400 | Dec 2015 | 1.100 | Dec 2016 | 0.700 | Dec 2017 | - | | 0.700 | Continuing | Continuing | Continuing |
| NGCM DEVELOPMENT 1 | C/CPAF | Argon ST : Fairfax, VA | 5.757 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.757 | - |
| NGCM DEVELOPMENT 2 | C/CPAF | Ultra : Braintree, MA | 5.484 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.484 | - |
| AASP SBIR Phase 2.5 | SS/CPFF | HAI : Cohasset, MA | 0.435 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.435 | - |
| | | **Subtotal** | 35.980 | 3.586 | | 8.849 | | 11.573 | | - | | 11.573 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRAVEL | WR | NAVSEA : Washington, DC | 0.572 | 0.040 | Oct 2015 | 0.080 | Oct 2016 | 0.080 | Oct 2017 | - | | 0.080 | Continuing | Continuing | Continuing |
| PROGRAM MANAGEMENT SUPPORT | C/CPAF | TECH MARINE : Washington, DC | 0.900 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.900 | - |
| PROGRAM MANAGEMENT SUPPORT | C/CPAF | BOOZ ALLEN : Washington, DC | 0.605 | 0.260 | Dec 2015 | 0.400 | Jun 2017 | 0.400 | Dec 2017 | - | | 0.400 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

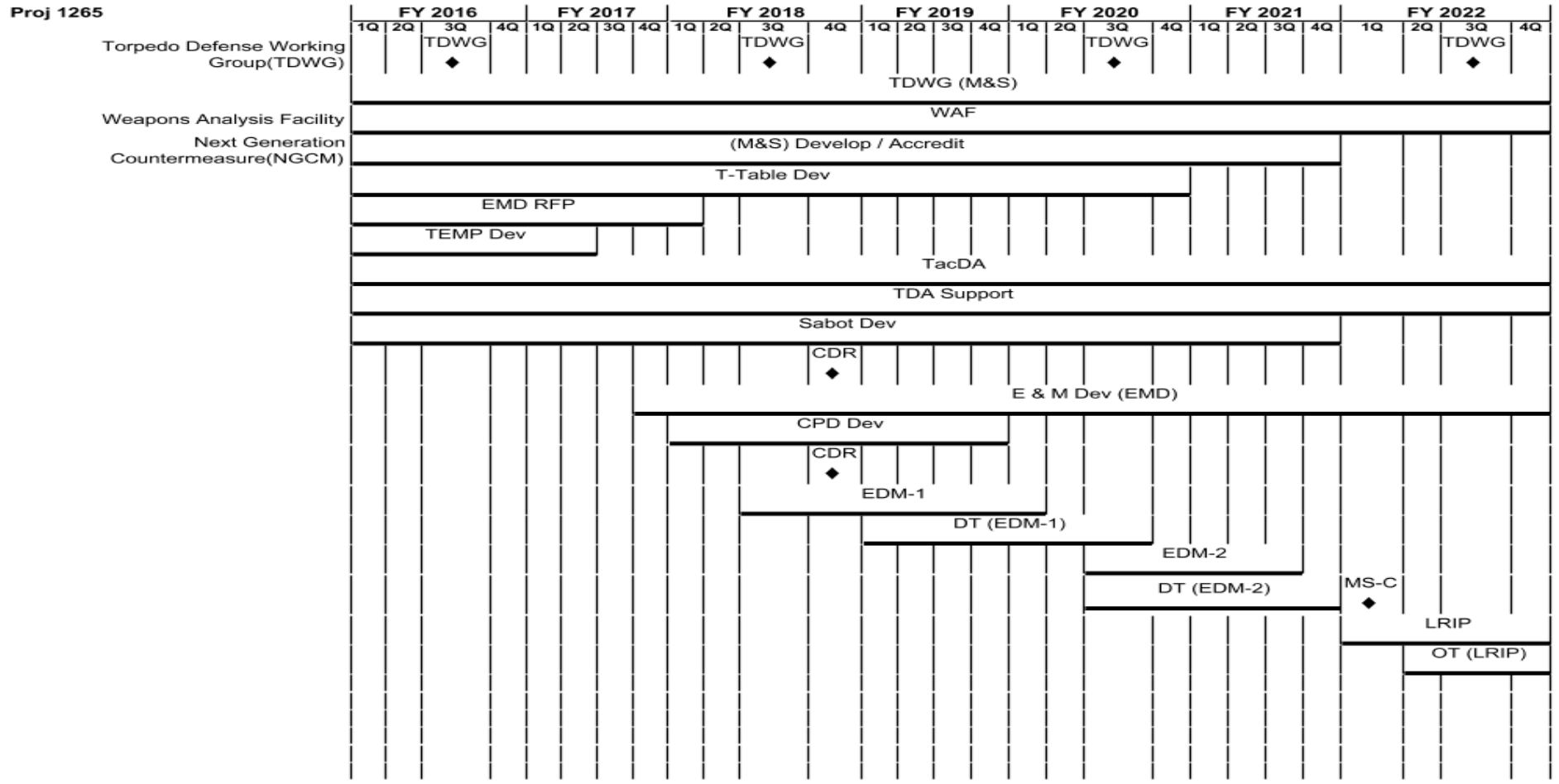
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 2.077 | 0.300 | | 0.480 | | 0.480 | | - | | 0.480 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 38.057 | 3.886 | | 9.329 | | 12.053 | | - | | 12.053 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |




*2018PB - 0101226N - 1265*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 1265*** | | | | |
| Torpedo Defense Working Group(TDWG): FY16 TDWG | 3 | 2016 | 3 | 2016 |
| Torpedo Defense Working Group(TDWG): FY18 TDWG | 3 | 2018 | 3 | 2018 |
| Torpedo Defense Working Group(TDWG): FY20 TDWG | 3 | 2020 | 3 | 2020 |
| Torpedo Defense Working Group(TDWG): FY22 TDWG | 3 | 2022 | 3 | 2022 |
| Torpedo Defense Working Group(TDWG): TDWG Modeling & Simulation (M&S) | 1 | 2016 | 4 | 2022 |
| Weapons Analysis Facility: COUNTERMEASURE (CM) EFFECTIVENESS/WEAPON ANALYSIS FACILITY (WAF) VULNERABILITY | 1 | 2016 | 4 | 2022 |
| Next Generation Countermeasure(NGCM): NGCM (M&S) Develop / Accredit | 1 | 2016 | 4 | 2021 |
| Next Generation Countermeasure(NGCM): NGCM T-Table Development | 1 | 2016 | 4 | 2020 |
| Next Generation Countermeasure(NGCM): EMD RFP | 1 | 2016 | 1 | 2018 |
| Next Generation Countermeasure(NGCM): NGCM TEMP Development | 1 | 2016 | 2 | 2017 |
| Next Generation Countermeasure(NGCM): Tactical Decision Aid (TacDA) | 1 | 2016 | 4 | 2022 |
| Next Generation Countermeasure(NGCM): Technical Direction Agent (TDA) Support | 1 | 2016 | 4 | 2022 |
| Next Generation Countermeasure(NGCM): Sabot Development | 1 | 2016 | 4 | 2021 |
| Next Generation Countermeasure(NGCM): Sabot CDR | 4 | 2018 | 4 | 2018 |
| Next Generation Countermeasure(NGCM): Engineering & Manufacturing Development (EMD) | 4 | 2017 | 4 | 2022 |
| Next Generation Countermeasure(NGCM): NGCM CPD Development | 1 | 2018 | 4 | 2019 |
| Next Generation Countermeasure(NGCM): NGCM Critical Design Review (CDR) | 4 | 2018 | 4 | 2018 |
| Next Generation Countermeasure(NGCM): EDM-1 | 3 | 2018 | 1 | 2020 |
| Next Generation Countermeasure(NGCM): DT (EDM-1) | 1 | 2019 | 3 | 2020 |
| Next Generation Countermeasure(NGCM): EDM-2 | 3 | 2020 | 3 | 2021 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101226N / *Submarine Acoustic War Dev* | **Project (Number/Name)**<br>1265 / *Sub Defensive Warfare* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Next Generation Countermeasure(NGCM): DT (EDM-2) | 3 | 2020 | 4 | 2021 |
| Next Generation Countermeasure(NGCM): MS-C | 1 | 2022 | 1 | 2022 |
| Next Generation Countermeasure(NGCM): LRIP | 1 | 2022 | 4 | 2022 |
| Next Generation Countermeasure(NGCM): OT (LRIP) | 2 | 2022 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101226N / *Submarine Acoustic War Dev* | Project (Number/Name)<br>9999 / *Congressional Adds* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9999: *Congressional Adds* | 0.000 | 0.772 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.772 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Project 9999/Congressional Add for "Compact Rapid Attack Weapon Program" will identify the program requirements to determine and justify a new start program by employing the 6" diameter Countermeasure Anti-Torpedo (CAT) in the submarine force.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2016 | FY 2017 |
|---|---|---|
| ***Congressional Add:*** Combat Rapid Attach Weapon Program | 0.772 | 0.000 |
| ***FY 2016 Accomplishments:*** This add will evaluate the technological readiness and engineering challenges associated with incorporating the CAT onto submarines as a defensive Anti-Torpedo Torpedo (ATT) to counter Non-Traditional Threat Torpedoes (NTTT). This study effort will involve subject matter experts from the Navy (primarily NUWC, Newport, to include torpedo, fire control, launcher, and systems integration expertise) and 6" CAT developers (at Applied Research Laboratory/Penn State University (ARL/PSU), as well as other warfare expertise such as from the Naval War College.<br>***FY 2017 Plans:*** N/A | | |
| **Congressional Adds Subtotals** | 0.772 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

To be determined.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0101402N *I Navy Strategic Comms* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 452.510 | 16.121 | 17.218 | 18.221 | - | 18.221 | 20.326 | 18.265 | 17.981 | 18.342 | Continuing | Continuing |
| 1083: *Shore To Ship Com System* | 184.152 | 15.341 | 16.235 | 17.125 | - | 17.125 | 19.278 | 17.206 | 17.155 | 17.499 | Continuing | Continuing |
| 3002: *Navy Strategic Comm Project* | 268.358 | 0.780 | 0.983 | 1.096 | - | 1.096 | 1.048 | 1.059 | 0.826 | 0.843 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Shore to Ship Communication System develops communication elements which support Navy Nuclear Command, Control, and Communications (NC3) strategic requirements, connecting the President of the United States (POTUS) to Ballistic Missile Submarines (SSBN) via the Fixed Submarine Broadcast System (FSBS). This portfolio of programs provides design and development for shore-to-ship transmit and receive communications systems. The portfolio also designs and develops shore-to-ship communications systems (i.e., Submarine Operating Authority Command, Control, and Communications (C3) Systems) in support of tactical communications with other submarine types (i.e., SSN & SSGN).

Realignment of funds from OPN to RDTEN for Nuclear Command, Control & Communications Nova Technical Change (NC3 NTC) to complete tech refresh and operational test and evaluation of the Nova software. The Nova software tech refresh will mitigate supply chain risk and comply with enhanced IA standards identified by National Security Agency (NSA) and Task Force Urgent Sentinel (TFUS).

The Navy Strategic Communications Project responds to emerging E-6B Airborne Strategic Command, Control and Communications capability requirements by performing technical evaluations, modeling and simulation, investigative ground and flight testing, enhanced software modifications and development of configuration modifications. The E-6B is a manned airborne platform that provides survivable, endurable and reliable Command, Control and Communications capability in support of the President, Secretary of Defense and United States strategic and non-strategic forces. These efforts support follow-on aircraft modification procurements necessary to ensure interoperability in information-assured network-centric strategic environments.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0101402N *I Navy Strategic Comms* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 16.558 | 17.218 | 16.020 | - | 16.020 |
| Current President's Budget | 16.121 | 17.218 | 18.221 | - | 18.221 |
| Total Adjustments | -0.437 | 0.000 | 2.201 | - | 2.201 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.437 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 2.200 | - | 2.200 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.001 | - | 0.001 |

**Change Summary Explanation**

Schedule Changes for Project 3002 - Upon completion of Studies & Analysis in FY16, Technical & Design Analysis and System Integration Lab Testing & Reporting will commence in FY 17 on advance technology development.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | Date: May 2017 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | | | | Project (Number/Name)<br>1083 / *Shore To Ship Com System* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 1083: *Shore To Ship Com System* | 184.152 | 15.341 | 16.235 | 17.125 | - | 17.125 | 19.278 | 17.206 | 17.155 | 17.499 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Shore to Ship Communications System develops communication elements which provide Nuclear Command, Control and Communications (NC3) between the President of the United States (POTUS) and Ballistic Missile Submarines (SSBN). This portfolio of programs provides design and development for shore-to-ship transmit and receive communications systems.

The Low Band Universal Communications System (LBUCS) is a modernization program that will upgrade the low-power transmit and receive subsystems of the Fixed Submarine Broadcast System (FSBS) which are approaching their operational end of life. LBUCS will ensure operational capability of the Very Low Frequency (VLF) architecture by providing system life extension and flexibility of submarine broadcast reception to submarines operating in a stealth posture. The flexibility includes enhanced throughput and anti-jam capability, ensuring more operational traffic is delivered to submarines without risking mast exposure. LBUCS will also deliver a simplified shore architecture, maintaining capability while maximizing use of shore infrastructure. Finally, LBUCS provides an upgrade to the VLF receive system, with all interoperable waveforms, to ensure continued compliance with Nuclear Command and Control System Technical Performance Criteria (NTPC).

The Strategic Communications Assessment Program/Continued Evaluation Program (SCAP/CEP) provides continuous assessment of the effectiveness of the Navy NC3 network and analysis of system performance in various mission locations by evaluating and reporting results of strategic exercises to the Fleet. Expanded CEP to include NOVA NIXT automated data collection.

The High Voltage Improvement Program (HVIP) develops technologies to improve the high voltage insulators, bushings, antenna and transmitter components used in the high-power Low Frequency/Very Low Frequency (LF/VLF) transmit systems of the Fixed Submarine Broadcast System (FSBS). These components provide Nuclear Command, Control and Communications (NC3) and are beyond their operational life expectancy.

The Broadcast Control Authority (BCA) project researches and models future solutions to address network/system interoperability, provides enterprise lab facilities and cybersecurity challenges of the four regional Submarine Operating Authority (SUBOPAUTH) BCA communication and network operations centers.

Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC) is the Shore to Ship Communication System that develops communication elements which support the Navy's NC3 requirements, providing various communications infrastructure and elements from the regional Submarine Operating Authority (SUBOPAUTH) to the deployed strategic platform (fleet ballistic missile submarines). This portfolio of programs designs and develops shore-to-ship transmit and receive communications systems (i.e., Fixed Submarine Broadcast System (FSBS) and SUBOPAUTH Command, Control, and Communications (C3) Systems) in support of communications with all submarine types (i.e., SSN, SSGN, and SSBN).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Low Band Universal Communication System (LBUCS) | 8.619 | 7.481 | 4.510 | 0.000 | 4.510 |
| ***Articles:*** | - | - | - | - | - |

***FY 2016 Accomplishments:***
-Commenced and completed LBUCS Transmit technical evaluation with EDM and completed LRIP units (DT-C1).
-Completed development of a new Very Low Frequency (VLF) Mode which will be incorporated into the LBUCS Receive development effort.
-Completed development of LBUCS Receive Engineering Development Model (EDM).
-Continued LBUCS Transmit development.
-Continued LBUCS Receive development.
-Commenced development of statutory and regulatory acquisition documentation in preparation for LBUCS Receive deployment.

***FY 2017 Plans:***
-Complete LBUCS Transmit development.
-Commence and complete LBUCS Transmit integrated test with completed LRIP units (DT-C2).
-Commence and complete LBUCS Transmit Testing with completed LRIP units (IOT&E), with Commander, Operational Test and Evaluation Force(COMOPTEVFOR).
-Commence and complete LBUCS Receive DT.
-Commence and complete LBUCS Receive EDM program review.
-Continue LBUCS Receive development.
-Continue development of statutory and regulatory acquisition documentation in preparation for LBUCS Receive deployment.
-Commence LBUCS Receive DT/OT.
-Commence the development of the next generation VLF receiver.

***FY 2018 Base Plans:***
-Complete LBUCS Receive development, and continue development of LBUCS Receive sub-modes.
-Complete development of statutory and regulatory acquisition documentation in preparation for LBUCS Receive deployment.
-Complete LBUCS Receive DT/OT.
-Continue the development of the next generation VLF receiver.

***FY 2018 OCO Plans:***

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Strategic Communications Assessment Program (SCAP)/Continuing Evaluation Program (CEP) | 4.462 | 4.687 | 4.383 | 0.000 | 4.383 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued development of automated data collection and analysis tools to reduce latency time between missions and results availability.<br>-Continued reports on performance, adherence to delivery time requirements and shortfalls.<br>-Continued mission analysis of SSBN Emergency Action Messages (EAM) reception for SSBN patrols.<br>-Commenced mission-based analysis for cyber risk on Navy Nuclear Command, Control and Communications (NC3) systems. | | | | | |
| ***FY 2017 Plans:***<br>-Continue development of automated data collection and analysis tools to reduce latency time between missions and results availability.<br>-Continue reports on performance, adherence to delivery time requirements and shortfalls.<br>-Continue mission analysis of Shore and SSBN EAM reception for SSBN patrols.<br>-Continue mission-based analysis for cyber risk on Navy Nuclear Command, Control and Communications (NC3) systems. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue development of automated data collection and analysis tools to reduce latency time between missions and results availability.<br>-Continue reports on performance, adherence to delivery time requirements and shortfalls.<br>-Continue mission analysis of Shore and SSBN EAM reception for SSBN patrols.<br>-Continue mission-based analysis for cyber risk on Navy Nuclear Command, Control and Communications (NC3) systems. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** High Voltage Improvement Program (HVIP) | 1.022 | 1.366 | 1.625 | 0.000 | 1.625 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed analysis of High Voltage Test Facility (HVTF) improvement to reduce sparking and increase operational voltage output. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued analysis of sulfur hexafluoride (SF6) breakdown in high voltage fields.<br>-Commenced testing of operational scale tuning reactor.<br>-Commenced development of Base Arc Gap for Umbrella Top Loaded Monopole (UTLM) towers.<br>-Commenced and completed assessment of tower light control box design in order to determine the best way forward on lighting control panels.<br>***FY 2017 Plans:***<br>-Complete analysis of sulfur hexafluoride (SF6) breakdown in high voltage fields.<br>-Complete development of Base Arc Gap for Umbrella Top Loaded Monopole (UTLM) towers.<br>-Continue testing of operational scale tuning reactor.<br>-Commence Low Frequency/Very Low Frequency (LF/VLF) environmental degradation, life span, and materials analysis.<br>***FY 2018 Base Plans:***<br>- Complete testing of operational scale tuning reactor.<br>- Continue Low Frequency/Very Low Frequency (LF/VLF) environmental degradation, life span, and materials analysis.<br>- Commence study to determine most efficient and durable design for tower risers<br>- Commence transmitter components analysis, testing, and specification development for the transmitter component of the Fixed Submarine Broadcast System (FSBS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Nuclear Command & Control Nova Tech Change (NC3 NTC) Build 2 | 0.000 | 1.200 | 3.407 | 0.000 | 3.407 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>-Commence system software development, integrate network monitoring and cybersecurity interfaces, conduct market research, and procure evaluation prototype equipment.<br>-Commence lab infrastructure support and deliver initial system level design documentation.<br>-Commence developer integration, software functional assessment, and functional integration testing.<br>-Commence engineering management oversight of software development and evaluation testing.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue system software development, integrate network monitoring and cybersecurity interfaces, conduct market research, and procure evaluation prototype equipment.<br>-Continue lab infrastructure support and deliver initial system level design documentation.<br>-Continue developer integration, software functional assessment, and functional integration testing.<br>-Continue engineering management oversight of software development and evaluation testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Broadcast Control Authority (BCA)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Continued systems and security engineering support for cybersecurity improvements.<br>-Commenced research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO C4I and other DoD organizations.<br>***FY 2017 Plans:***<br>-Continue systems and security engineering support for cybersecurity improvements.<br>-Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO DoD organizations.<br>-Commence establishment of Integrated Test Facility (ITF) and interconnectivity between other labs for end-to-end testing of FSBS Low Power and supporting C3 systems.<br>***FY 2018 Base Plans:***<br>-Continue establishment of Integrated Test Facility (ITF) and interconnectivity between other labs for end-to-end testing of FSBS Low Power and supporting C3 systems.<br>-Continue systems and security engineering support for cybersecurity improvements.<br>-Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO DoD organizations.<br>***FY 2018 OCO Plans:***<br>N/A | 1.238<br>- | 1.501<br>- | 3.200<br>- | 0.000<br>- | 3.200<br>- |
| **Accomplishments/Planned Programs Subtotals** | 15.341 | 16.235 | 17.125 | 0.000 | 17.125 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/3107: *Submarine Broadcast* | 15.485 | 34.151 | 29.669 | - | 29.669 | 29.666 | 30.227 | 32.351 | 32.986 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Low Band Universal Communications System (LBUCS): LBUCS is the modernization program that will upgrade the low power Transmit and Receive subsystems of the Fixed Submarine Broadcast System which are approaching their operational end of life. The program achieved Milestone C in FY14. The Full Deployment Decision for Transmit is in FY17. The testing of LBUCS completes in FY18. The Full Fielding Program Review for Receive is in FY18.

**E. Performance Metrics**

LBUCS FY18: Complete Full Fielding Decisions and Operational Testing.

Strategic Communications Assessment Program (SCAP)/Continuing Evaluation Program (CEP) FY18: Delivery of Submersible Ballistic Nuclear Submarine (SSBN) patrol reports.

High Voltage Improvement (HVIP) Program FY18: Complete testing of operational scale tuning reactor.

Broadcast Control Authority (BCA) FY18: Continue establishment of Broadcast Control Authority (BCA) Integrated Test Facility (ITF) and interconnectivity between other labs. Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO C4I and other DoD organizations.

Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC) FY18: Complete development and engineering efforts for the transition of Navy NC3 NTC Software (Build 2)into the program of record.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | Project (Number/Name)<br>1083 / *Shore To Ship Com System* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | SSC PAC : San Diego, CA | 9.727 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.727 | - |
| Software Development | WR | SSC PAC : San Diego, CA | 12.956 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 12.956 | - |
| LBUCS: Systems Engineering | WR | SSC LANT : Charleston, SC | 9.123 | 0.854 | Nov 2015 | 0.250 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 10.227 | - |
| LBUCS: Primary Hardware Development | WR | SSC LANT : Charleston, SC | 0.000 | 0.356 | Nov 2015 | 0.113 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.469 | - |
| LBUCS: Systems Engineering | WR | SSC PAC : San Diego, CA | 1.860 | 0.839 | Nov 2015 | 1.646 | Nov 2016 | 0.554 | Nov 2017 | - | | 0.554 | Continuing | Continuing | Continuing |
| LBUCS: Software Development | WR | SSC PAC : San Diego, CA | 4.556 | 0.555 | Nov 2015 | 0.713 | Nov 2016 | 0.417 | Nov 2017 | - | | 0.417 | Continuing | Continuing | Continuing |
| LBUCS: Software Development (DC) | C/IDIQ | SSC PAC : San Diego, CA | 0.923 | 0.942 | Nov 2015 | 1.080 | Nov 2016 | 0.566 | Nov 2017 | - | | 0.566 | Continuing | Continuing | Continuing |
| NC3 NTC - Software Development | WR | SSC PAC : San Diego | 0.000 | 0.000 | | 0.700 | May 2017 | 0.700 | Nov 2017 | - | | 0.700 | 0.000 | 1.400 | - |
| NC3 NTC - Contractor Engineering Support | C/FPIF | Various : Various | 0.000 | 0.000 | | 0.000 | | 2.200 | Jan 2018 | - | | 2.200 | 0.000 | 2.200 | - |
| Product Development Prior Years | Various | Various : Various | 66.297 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 66.297 | 66.297 |
| | | **Subtotal** | 105.442 | 3.546 | | 4.502 | | 4.437 | | - | | 4.437 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acquisition/Program Development | WR | SSC PAC : San Diego, CA | 3.200 | 0.115 | Nov 2015 | 0.066 | Nov 2016 | 0.066 | Nov 2017 | - | | 0.066 | Continuing | Continuing | Continuing |
| LBUCS: Acquisition/ Program Development/ Logistics | C/CPFF | CSA : San Diego, CA | 0.000 | 0.000 | | 0.200 | Feb 2017 | 0.211 | Nov 2017 | - | | 0.211 | 0.000 | 0.411 | - |
| LBUCS: Information Assurance | C/CPFF | Merdan Group : San Diego, CA | 1.306 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.306 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | Project (Number/Name)<br>1083 / *Shore To Ship Com System* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LBUCS: Security Engineering | C/CPFF | G2 OPS : Virginia Beach, VA | 0.000 | 0.127 | Jan 2016 | 0.126 | Nov 2016 | 0.129 | Nov 2017 | - | | 0.129 | 0.000 | 0.382 | - |
| LBUCS: Information Assurance | WR | SSC PAC : San Diego, CA | 1.333 | 0.234 | Nov 2015 | 0.120 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.687 | - |
| LBUCS: Acquisition/ Program Development | C/CPFF | CSA : San Diego, CA | 3.556 | 0.690 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.246 | - |
| LBUCS: Systems Engineering | C/CPFF | FSI : San Diego, CA | 1.530 | 0.334 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.864 | - |
| LBUCS: Systems Engineering | C/CPFF | G2 OPS : San Diego, CA | 0.000 | 0.000 | | 0.130 | Nov 2016 | 0.167 | Nov 2017 | - | | 0.167 | Continuing | Continuing | Continuing |
| Shore to Ship: Broadcast Control Authority | C/CPFF | FSI : San Diego, CA | 0.680 | 1.238 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.918 | - |
| LBUCS: Logistics Support | C/CPFF | CSA : San Diego, CA | 1.022 | 0.607 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.629 | - |
| LBUCS: Cost Estimating | C/CPFF | TASC : San Diego, CA | 0.330 | 0.216 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.546 | - |
| Shore to Ship: High Voltage Improvement Program (HVIP) Studies and Design | WR | SSC PAC : San Diego, CA | 3.985 | 1.022 | Nov 2015 | 1.366 | Nov 2016 | 1.290 | Nov 2017 | - | | 1.290 | Continuing | Continuing | Continuing |
| Shore to Ship: High Voltage Improvement Program (HVIP) Studies and Design | WR | SSC LANT : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 0.335 | Jan 2018 | - | | 0.335 | Continuing | Continuing | Continuing |
| Shore to Ship: BCA: Systems Engineering | WR | SSC LANT : Charleston, SC | 0.000 | 0.000 | | 1.501 | Nov 2016 | 1.555 | Nov 2017 | - | | 1.555 | Continuing | Continuing | Continuing |
| NC3 NTC - Technical Design Documentation | WR | SSC PAC : San Diego | 0.000 | 0.000 | | 0.150 | May 2017 | 0.150 | Nov 2017 | - | | 0.150 | 0.000 | 0.300 | - |
| Support Prior Years | Various | Various : Various | 5.592 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.592 | 5.592 |
| | | **Subtotal** | 22.534 | 4.583 | | 3.659 | | 3.903 | | - | | 3.903 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | Project (Number/Name)<br>1083 / *Shore To Ship Com System* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCAP/CEP: Strategic OP Systems Performance Evaluation | C/CPFF | APL/JHU : Baltimore, MD | 37.223 | 4.462 | Jan 2016 | 4.687 | Jan 2017 | 4.383 | Jan 2018 | - | | 4.383 | Continuing | Continuing | Continuing |
| LBUCS: System Testing | WR | COTF : Norfolk, VA | 1.664 | 0.525 | Nov 2015 | 0.250 | Nov 2016 | 0.699 | Nov 2017 | - | | 0.699 | Continuing | Continuing | Continuing |
| LBUCS: System Testing | WR | SSC PAC : San Diego, CA | 3.305 | 1.247 | Nov 2015 | 1.074 | Nov 2016 | 1.109 | Nov 2017 | - | | 1.109 | Continuing | Continuing | Continuing |
| LBUCS: System Testing | WR | JITC : Fort Huachuca, AZ | 0.203 | 0.207 | Nov 2015 | 0.225 | Nov 2016 | 0.335 | Nov 2017 | - | | 0.335 | Continuing | Continuing | Continuing |
| LBUCS: Hardware Support for Testing | WR | SSC LANT : Charleston, SC | 0.054 | 0.058 | Nov 2015 | 0.929 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.041 | - |
| Shore to Ship: BCA Hardware Support for Testing | WR | SSC LANT : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 1.646 | Nov 2017 | - | | 1.646 | Continuing | Continuing | Continuing |
| NC3 NTC - System Testing | TBD | SSC PAC : San Diego | 0.000 | 0.000 | | 0.290 | May 2017 | 0.290 | Nov 2017 | - | | 0.290 | 0.000 | 0.580 | - |
| | | **Subtotal** | 42.449 | 6.499 | | 7.455 | | 8.462 | | - | | 8.462 | - | - | - |

**Management Services ($ in Millions)**

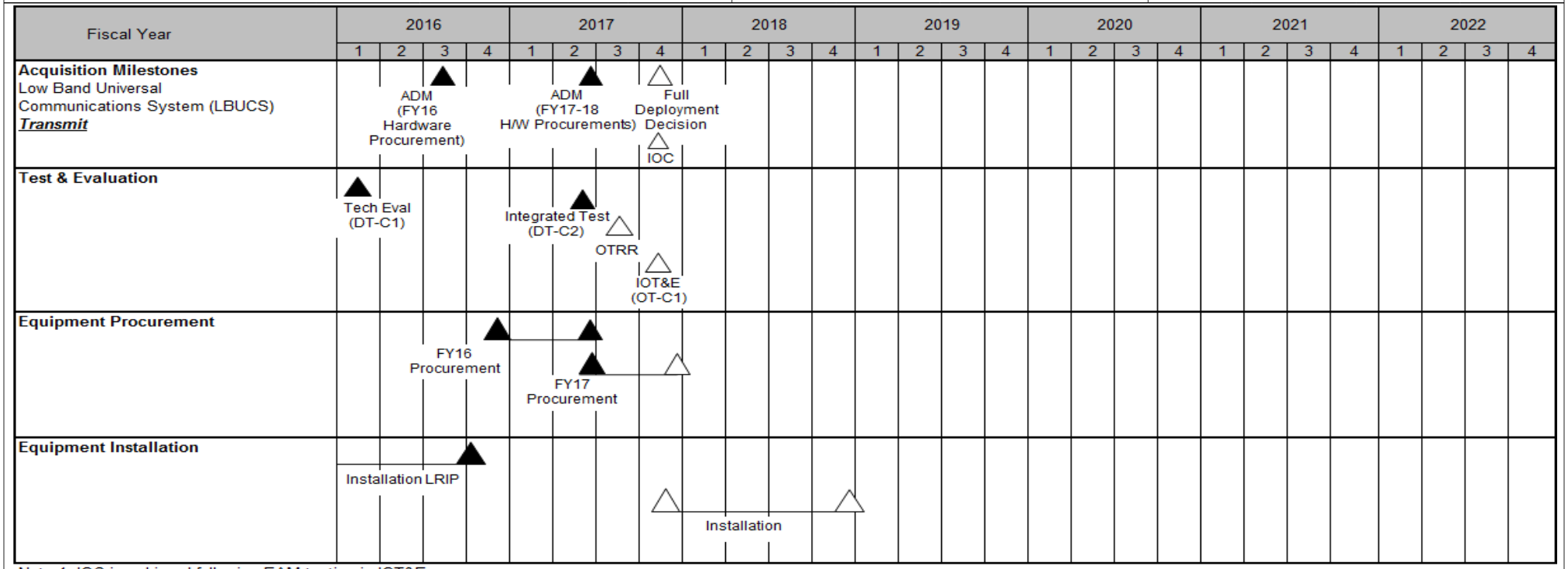
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LBUCS: Program Management | WR | SSC PAC : San Diego, CA | 9.381 | 0.386 | Nov 2015 | 0.225 | Nov 2016 | 0.066 | Nov 2017 | - | | 0.066 | Continuing | Continuing | Continuing |
| Contractor Engineering Support | MIPR | MITRE : San Diego, CA | 3.930 | 0.327 | Nov 2015 | 0.334 | Nov 2016 | 0.197 | Nov 2017 | - | | 0.197 | Continuing | Continuing | Continuing |
| LBUCS: Travel | WR | SSC PAC : San Diego, CA | 0.416 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.416 | - |
| NC3 NTC - Program Management | TBD | SSC PAC : San Diego | 0.000 | 0.000 | | 0.060 | May 2017 | 0.060 | Nov 2017 | - | | 0.060 | 0.000 | 0.120 | - |
| | | **Subtotal** | 13.727 | 0.713 | | 0.619 | | 0.323 | | - | | 0.323 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | Project (Number/Name)<br>1083 / *Shore To Ship Com System* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 184.152 | 15.341 | | 16.235 | | 17.125 | | - | | 17.125 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

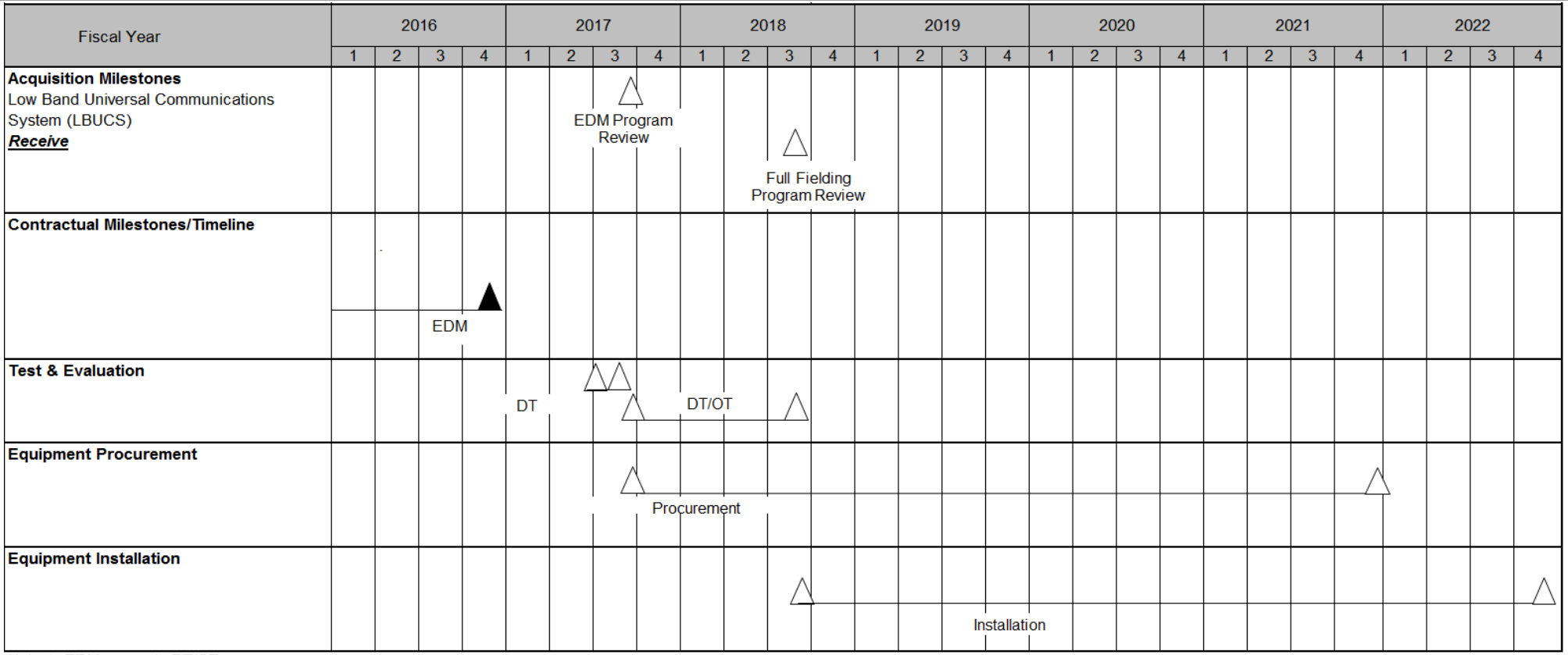



Note 1: IOC is achieved following EAM testing in IOT&E.
Note 2: The ADMs provide hardware acquisition authority by Milestone Decision Authority prior to the IOT&E report.
Note 3: LBUCS Transmit equipment and cables will be installed in racks and must go through acceptance and integration testing prior to installation. Timeframe varies due to complexity of each site's unique system configuration.

**Acronym Legend:**

ADM: Acquisition Decision Memorandum
BCA: Broadcast Control Authority
BTS: Broadcast Transmitter Station
CPD: Capability Production Document
DT: Developmental Testing
FRP: Full Rate Production
IOC: Initial Operational Capability
IOT&E: Initial Operational Test and Evaluation
LRIP: Low-Rate Initial Production
MS-C: Milestone C
OT: Operational Testing
OTRR: Operational Test Readiness Review
Tech Eval: Technical Evaluation

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |




Note 1: EDM supports DT/OT

Note 2: EDM program review will result in procurement authority.

**Acronym Legend:**

CDR: Critical Design Review

DT: Developmental Testing

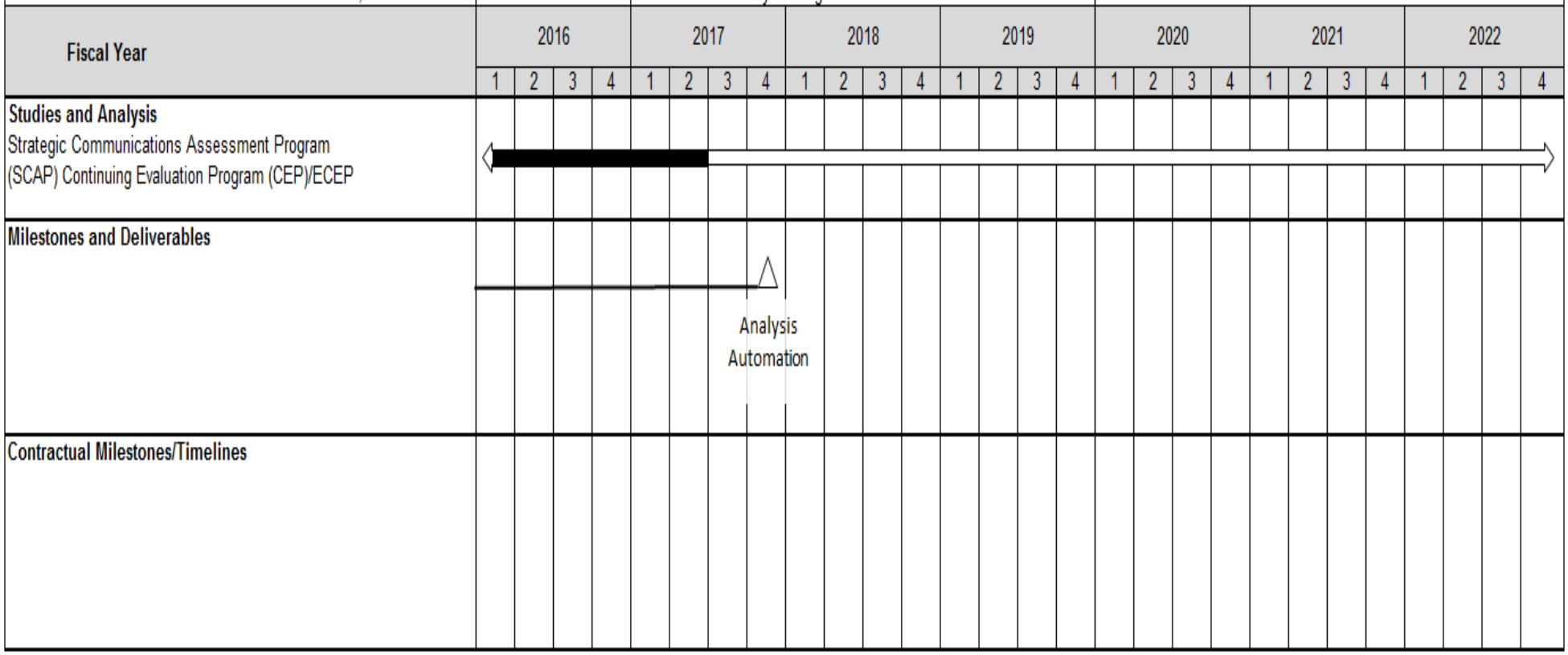
EDM: Engineering Development Model

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

**Exhibit R-4, RDT&E Schedule Profile:** FMB 2018 Navy
Strategic Communications Assessment Program (SCAP) Continuing Evaluation Program (CEP)/Expanded Continuing Evaluation Program (ECEP)

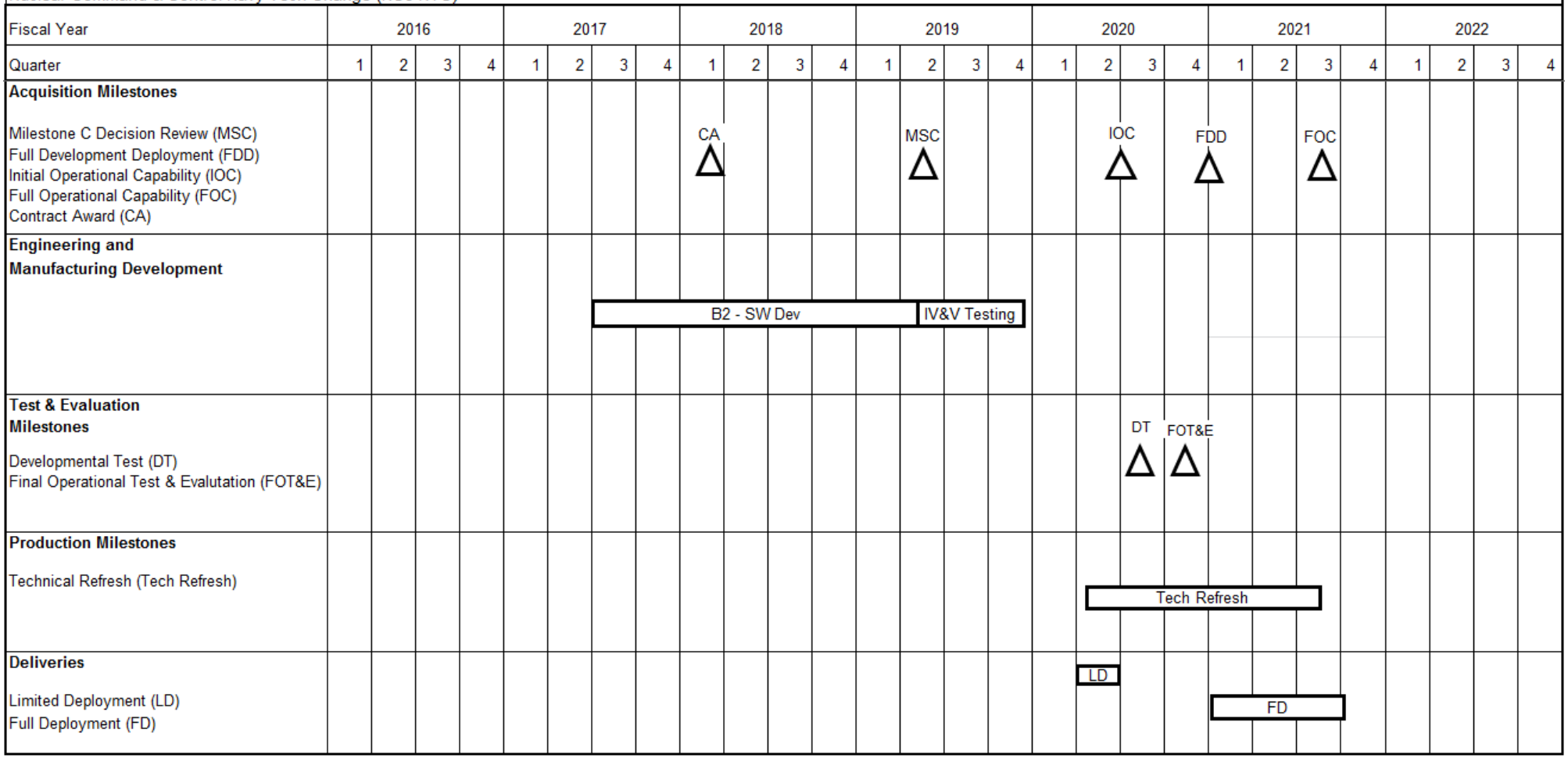
DATE: March 2017

| APPROPRIATION/BUDGET ACTIVITY | PROGRAM ELEMENT NUMBER AND NAME | PROJECT NUMBER AND NAME |
|---|---|---|
| RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7 | PE 0101402N / Navy Strategic Comms | 1083 SCAP/CEP |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

Nuclear Command & Control Navy Tech Change (NC3 NTC)



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 1083*** | | | | |
| LBUCS: LRIP Installation - Transmit | 1 | 2016 | 4 | 2016 |
| LBUCS: Developmental Test (DT-C1)/Technical Evaluation - Transmit | 1 | 2016 | 1 | 2016 |
| LBUCS: Acquisition Decision Memorandum (ADM) (FY16 Hardware Procurement) - Transmit | 3 | 2016 | 3 | 2016 |
| LBUCS: FY16 Hardware Procurement - Transmit | 4 | 2016 | 2 | 2017 |
| LBUCS: Integrated Test (DT-C2) - Transmit | 2 | 2017 | 2 | 2017 |
| LBUCS: ADM (FY17-18 H/W Procurements) - Transmit | 2 | 2017 | 2 | 2017 |
| LBUCS: FY17 Procurement - Transmit | 2 | 2017 | 4 | 2017 |
| LBUCS: Operational Test Readiness Review (OTRR) - Transmit | 3 | 2017 | 3 | 2017 |
| LBUCS: Operational Test (IOT&E) - Transmit | 4 | 2017 | 4 | 2017 |
| LBUCS: Initial Operational Capability (IOC) - Transmit | 4 | 2017 | 4 | 2017 |
| LBUCS: Full Deployment Decision - Transmit | 4 | 2017 | 4 | 2017 |
| LBUCS: Installation - Transmit | 4 | 2017 | 4 | 2018 |
| LBUCS: Engineering Design Model (EDM) - Receive | 1 | 2016 | 4 | 2016 |
| LBUCS: Developmental Test (DT) - Receive | 3 | 2017 | 3 | 2017 |
| LBUCS: EDM Program Review - Receive | 3 | 2017 | 3 | 2017 |
| LBUCS: Developmental Testing/Operational Testing (DT/OT) - Receive | 3 | 2017 | 3 | 2018 |
| LBUCS: Full Fielding Program Review - Receive | 3 | 2018 | 3 | 2018 |
| LBUCS: Procurement - Receive | 3 | 2017 | 4 | 2021 |
| LBUCS: Installation - Receive | 3 | 2018 | 4 | 2022 |
| CEP: Studies and Analysis | 1 | 2016 | 4 | 2022 |
| CEP: Analysis Automation | 1 | 2016 | 4 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>1083 / *Shore To Ship Com System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| NC3 NTC: Acquistion MS - Milestone C Decision Review (MSC) | 2 | 2019 | 2 | 2019 |
| NC3 NTC: Acquistion MS - Full Development Deployment (FDD) | 4 | 2020 | 4 | 2020 |
| NC3 NTC: Acquistion MS - Initial Operational Capability (IOC) | 2 | 2020 | 2 | 2020 |
| NC3 NTC: Acquistion MS - Full Operational Capability (FOC) | 3 | 2021 | 3 | 2021 |
| NC3 NTC: Acquistion MS - Contract Award (CA) | 1 | 2018 | 1 | 2018 |
| NC3 NTC: Engineering & Manufacturing Development - B2 SW Dev | 3 | 2017 | 2 | 2019 |
| NC3 NTC: Engineering & Manufacturing Development - Independent Verification & Validation (IV&V) | 2 | 2019 | 4 | 2019 |
| NC3 NTC: Test & Evaluation MS Development - DT | 3 | 2020 | 3 | 2020 |
| NC3 NTC: Test & Evaluation MS Development - Final Operational Test & Evaluation (FOT&E) | 4 | 2020 | 4 | 2020 |
| NC3 NTC: Production MS - Tech Refresh | 2 | 2020 | 3 | 2021 |
| NC3 NTC: Deliverables - Limited Deployment (LD) | 2 | 2020 | 2 | 2020 |
| NC3 NTC: Deliverables - Full Deployment (FD) | 1 | 2021 | 3 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0101402N / *Navy Strategic Comms* | | | | Project (Number/Name)<br>3002 / *Navy Strategic Comm Project* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 3002: *Navy Strategic Comm Project* | 268.358 | 0.780 | 0.983 | 1.096 | - | 1.096 | 1.048 | 1.059 | 0.826 | 0.843 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The E-6 is a manned airborne platform that provides survivable, endurable and reliable Command, Control and Communications capability in support of the President, Secretary of Defense and United States strategic and non-strategic forces. In order to respond effectively to emerging capability requirements, continued effort is needed to perform technical evaluations, modeling and simulation, investigative ground and flight testing, enhanced software modifications and development of configuration modifications. Funding is for engineering and analysis of hardware/software required to optimize E-6 systems for interoperability in a strategic environment.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Operational System Development, Studies and Demonstrations | 0.780 | 0.983 | 1.096 | 0.000 | 1.096 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Performed and conducted advanced simulations, integrations and demonstrations using the E-6B Systems Integration Laboratory and contractor assets of newly developed commercial technology to address system obsolescence and potential upgrades to ensure survivability and reliability of the E-6B platform. | | | | | |
| ***FY 2017 Plans:***<br>Perform and conduct demonstrations of moderate technical readiness level hardware as tailored for E-6B weapons systems usage. Anticipated demonstrations will be in support of development of fiber optic transmission and control and power system upgrades and efficiencies. | | | | | |
| ***FY 2018 Base Plans:***<br>Perform and conduct advanced simulations, integrations and demonstrations using the E-6B Systems Integration Laboratory and contractor assets to address system obsolescence and potential upgrades to ensure interoperability of the E-6B platform. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.780 | 0.983 | 1.096 | 0.000 | 1.096 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0101402N / *Navy Strategic Comms* | **Project (Number/Name)**<br>3002 / *Navy Strategic Comm Project* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN 056400: *E-6 Series* | 178.987 | 222.077 | 223.508 | - | 223.508 | 203.495 | 132.476 | 150.854 | 153.857 | 375.346 | 2,763.689 |

**Remarks**

**D. Acquisition Strategy**

"Research, Development, Test & Evaluation, Navy (RDT&E,N) funds continuing efforts to perform technical evaluations, modeling & simulation and investigative ground and flight testing. Aircraft Procurement, Navy, Modification of Aircraft (APN-5) funds integration, procurement and installation of aircraft modifications."

**E. Performance Metrics**

Mission Systems Evaluation; Technical Analysis 1st Qtr FY18, Design Analysis 2nd Qtr FY18, Systems Integration Lab (SIL) Test and Reporting 4th Qtr FY18.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0203761N *I Rapid Technology Transition (RTT)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 22.389 | 7.626 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 30.015 |
| 3173: *Technology Insertion Program for Savings (TIPS)* | 22.389 | 7.626 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 30.015 |

**A. Mission Description and Budget Item Justification**

MISSION:

The Technology Insertion Program for Savings (TIPS) transitions technology from any source, including those not traditionally associated with defense technology. An effective and robust integration of commercial and military technologies can reduce costs by keeping pace with the fast moving changes in technologies and operational needs. The TIPS program is structured to bring transition deals to closure quickly, and to provide execution year funding for a quick start, bridging the gap until the program of record can fund the completion of the technology insertion.

The mission of the TIPS program is to increase the rate that new cutting edge technologies are inserted into DON acquisition programs in order to significantly reduce operations and maintenance support costs. Opportunities occur when a sufficiently mature technology is identified that can meet a particular need on a timetable which matches that of an acquisition program, and is supported by a business case which justifies the associated cost and schedule risk. The combination of circumstances which create such opportunities can appear, and disappear, well inside the normal budget cycle. This program is designed to be proactive in identifying opportunities and to work with resource sponsors, fleet and force users, and Program Managers (PMs) in constructing viable technology transition deals, one at a time. To ensure the widest possible awareness of emergent commercial technology opportunities, this program interacts with the industry and coordinates closely with Program Executive Offices (PEOs) and Program Managers (PMs) to maintain awareness of insertion opportunities. Utilizing existing authorities, TIPS applies execution year funds where necessary to "jump-start" transitions so they can be inserted and validated leading directly to deployment and/or demonstrations of high risk/high payoff technologies. This Program Element is the only Navy program that addresses current opportunities to reduce operations and support (O&S) cost drivers within a 18-24 month period. As such, planning and initiation are accomplished within the same fiscal year, which causes a non-traditional financial execution profile for the program. The program therefore does not meet traditional expenditure benchmarks for the first year of execution, but rapidly recovers in the second year.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0203761N *I Rapid Technology Transition (RTT)* |

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 8.632 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 7.626 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | -1.006 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.884 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.122 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |

**Change Summary Explanation**

The FY 2016 funding request was reduced by -$0.5 million to account for the availability of prior year execution balances.

Beginning in FY 2017, funding is realigned to PE 0603382N Advanced Combat Systems Technology for Rapid Prototype Development.

Technical: Not applicable.

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0203761N / *Rapid Technology Transition (RTT)* | Project (Number/Name)<br>3173 / *Technology Insertion Program for Savings (TIPS)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3173: *Technology Insertion Program for Savings (TIPS)* | 22.389 | 7.626 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 30.015 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The mission of the Technology Insertion Program for Savings (TIPS) is to fund smart solutions for rapid insertion of new technologies that are inserted into DON acquisition programs in order to reduce operations and maintenance support costs across DoN acquisition programs. The TIPS program is structured to quickly transition applicable commercial off-the- shelf solutions and late-stage development technologies from any source, to meet emerging opportunities that lead to cost efficiencies in operations, maintenance, support, training, and/or logistics, and is supported by a business case that justifies all associated costs and schedule risks while demonstrating a positive return on investment (ROI) that is quantifiable and clearly explained given realistic assumptions. TIPS provides execution year funding for a rapid start, bridging the gap until the program of record can fund the completion of the technology insertion.

Beginning in FY 2017, funding is realigned to new PE 0603382N Advanced Combat Systems Technology for Rapid Prototype Development.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TECHNOLOGY INSERTION PROGRAM FOR SAVINGS (TIPS) | 7.626 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |
| Projects scheduled to complete in FY 2016: (Name & ROI% Averaged Over 5 years) | | | | | |
| - Virginia Class TEMPALT Electronics Rack: ROI% 961 completed | | | | | |
| - Modified Induction Heat Technology for Reduced Cost Removal of Special Hull Treatment: ROI% 754 completed | | | | | |
| - Advanced Buoyant Cable Antenna (ABCA): ROI% 38 completed | | | | | |
| - Lot Serial Number Accuracy (LSNA): ROI% 360 completed | | | | | |
| - LCS Class 1 Stern Tube Seal Design Improvements: ROI% 7540 completed | | | | | |
| - Interactive Structural Analysis Environment & Management System: ROI% 11809 completed | | | | | |
| - Submarine Combat System Architecture Modernization: ROI% 1408 completed | | | | | |
| - Autonomous Target Acquisition Weapon Image Source Expansion: ROI% 469 completed | | | | | |
| - Remote Mine-hunting System Cable Maintenance Winch: ROI% 367 completed | | | | | |
| - Intermediary Application for Key Management Infrastructure: ROI% 690 completed | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0203761N / *Rapid Technology Transition (RTT)* | **Project (Number/Name)**<br>3173 / *Technology Insertion Program for Savings (TIPS)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Navy Nuclear Command, Control, & Comms Emergency Action Message Enhanced Technology (NEET): ROI % 438 completed<br><br>Projects scheduled to complete in FY 2017:<br>- Radar Technology Engineering Upgrades A, B, & C completed<br>(A) ROI% 313<br>(B) ROI% 120<br>(C) ROI% 92<br>- Virtualization in Submarine Warfare Federated Tactical System (V-SWFTS): ROI% 4254 scheduled to complete end of FY 2017<br>***FY 2017 Plans:***<br>Funding realigned to PE 0603382N Advanced Combat Systems Technology for Rapid Prototype Development.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 7.626 | 0.000 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Utilize existing authorities on a case-specific basis to exploit rapid technology transition opportunities.

**E. Performance Metrics**

The TIPS program will initiate new projects each year that provide for new, innovative, and potentially disruptive technology being inserted into DON acquisition programs. The TIPS projects will have a greater than 70% success rate of insertion and fielding of technology into DON warfighting systems and/or operations and support cost efforts.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204136N *I F/A-18 Squadrons* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 4,908.354 | 132.905 | 189.125 | 224.470 | - | 224.470 | 286.160 | 259.201 | 140.114 | 68.077 | Continuing | Continuing |
| 1662: *F/A-18 Improvement* | 4,186.504 | 106.905 | 67.886 | 69.759 | - | 69.759 | 61.510 | 50.431 | 52.133 | 53.201 | Continuing | Continuing |
| 2065: *F/A-18 Radar Upgrade* | 711.982 | 14.552 | 13.926 | 8.018 | - | 8.018 | 7.158 | 8.951 | 8.961 | 9.147 | Continuing | Continuing |
| 2069: *F/A-18 Infrared Search and Track (IRST)* | 0.000 | 0.000 | 107.313 | 86.993 | - | 86.993 | 132.892 | 109.919 | 48.320 | 5.729 | Continuing | Continuing |
| 2071: *F/A-18 Block III* | 0.000 | 0.000 | 0.000 | 59.700 | - | 59.700 | 84.600 | 89.900 | 30.700 | 0.000 | 0.000 | 264.900 |
| 9999: *Congressional Adds* | 9.868 | 11.448 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 21.316 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** P510 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The F/A-18 is required to perform multiple missions. Capabilities of the F/A-18 weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons as well as advances in technology to respond effectively to emerging future threats. Continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030. Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of a fused picture between these sensors. Additionally, continued advanced development engineering for improvements in reliability and maintainability are required to ensure maximum benefit is achieved through reduced cost of ownership and to provide enhanced availability.

Future integrated Carrier Air Wing CONOPS demand certain changes to the base line Block II Super Hornet. In response, the Block III Super Hornet is submitted. While none of the changes to the aircraft are considered revolutionary, the combined impact to the capability of the aircraft and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which can be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY18 budget request funds Non-Recurring (NRE) for these ECPs.

Congressional adds are for support of Dual Mode Brimstone and an engine noise reduction study. Funding added for Dual Mode Brimstone Integration on the F-18 aircraft has been reallocated to Universal Armament Interface (UAI) efforts. UAI implementation will bring the baseline standardized functionality to UAI compliant Air-to-Ground Type 1 weapons (standard launcher technology and enhanced functionality to UAI compliant Air-to-Ground Type 2 weapons (smart launcher technology)).

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204136N *I F/A-18 Squadrons* |

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 135.755 | 189.125 | 165.548 | - | 165.548 |
| Current President's Budget | 132.905 | 189.125 | 224.470 | - | 224.470 |
| Total Adjustments | -2.850 | 0.000 | 58.922 | - | 58.922 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.011 | 0.000 | | | |
| • SBIR/STTR Transfer | -2.840 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 58.386 | - | 58.386 |
| • Rate/Misc Adjustments | 0.001 | 0.000 | 0.536 | - | 0.536 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2016 | FY 2017 |
|---|---|---|
| **Project:** 9999: *Congressional Adds* | | |
| Congressional Add: *Dual Mode Brimstone Integration* | 10.000 | 0.000 |
| Congressional Add: *Noise Reduction* | 1.448 | 0.000 |
| Congressional Add Subtotals for Project: 9999 | 11.448 | 0.000 |
| Congressional Add Totals for all Projects | 11.448 | 0.000 |

**Change Summary Explanation**

Technical:
1662: Not Applicable

2065: Not Applicable

2069: Not Applicable

2071: Block III request for F/A-18E/F capability upgrades Non-recurring Engineering (NRE) funding is included with the budget.

Schedule:

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204136N *I F/A-18 Squadrons* |

1662: The IRST LRIP II contract award for Block I systems has been deferred from 1st Quarter 2016 to 4th Quarter 2016, pending Milestone Decision Authority (MDA) approval.

Software Development build (31C) has been deferred from 1st Quarter 2016 to 1st Quarter 2017 to accommodate ongoing Software Development work with builds 27C and 29C work.

2065: Not Applicable

2069: IRST program schedule was changed.

2071: Block III request for F/A-18E/F capability upgrades Non-recurring Engineering (NRE) funding is included with the budget.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>1662 / *F/A-18 Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1662: *F/A-18 Improvement* | 4,186.504 | 106.905 | 67.886 | 69.759 | - | 69.759 | 61.510 | 50.431 | 52.133 | 53.201 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The F/A-18 is a multi-mission strike fighter aircraft that is used in Air-to-Air, strike, surveillance, reconnaissance and tanking roles through selected use of external equipment (fuel tanks, tactical and reconnaissance pods, and various ordnance launching racks). Additional capabilities are required for interoperability in a network-centric tactical environment. In order to respond effectively to emerging future threats, F/A-18 aircraft capabilities are being expanded and upgraded to incorporate new/enhanced weapons systems and avionics including Dual Mode Weapons, Counter-Electronic Attack (CEA), Infra-red Search and Track (IRST) integrated with the Active Electronically Scanned Array (AESA) Radar to provide Narrow Band High Gain Electronic Attack and Multi-System Integration. Continued advanced development engineering and analysis of hardware/software is required to successfully optimize fleet F/A-18 weapon systems for interoperability in a network centric tactical environment (such as Naval Integrated Fire Control-Counter Air), to include: enhanced software capabilities, potential new hardware development, enhanced existing hardware, and enhanced network centric capabilities. Additionally, continued effort is needed to perform technical evaluations, modeling and simulations, investigative flight testing, enhanced software modifications based on reported fleet deficiencies and the development and testing of design modifications to address obsolescence issues with the F/A-18 weapon system and ancillary equipment. This funding line continues F/A-18E/F "Flight Plan" spiral capability development, to include Multi-System Integration and further Flight Plan Engineering and System Configuration Set development and integration. This budget continues funding for F/A-18A-F Test Wing Maintenance support and funds development efforts needed for integration of air launched laser guided rockets on F/A-18 A+/C/D.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Infra-Red Search and Track (IRST) | 43.365 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Technology development and engineering and manufacturing development of an IRST sensor for the F/A-18 E/F. Block I supports technology development and engineering and manufacturing development of an IRST sensor for the F/A-18E/F to provide an alternate fire control system in a high Electronic Attack / Radio Detection and Ranging (RADAR) denied environment. Block II IRST modifies the Infra-Red Receiver and processor to provide full Capabilities Development Document capability and enhanced warfighting capability through an improved engagement timeline, improved situational awareness, longer range passive detection and tracking and a larger field of regard with specification performance. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Begin additional development efforts for fleet required Long Wave Infrared Search and Track (LWIRST). Conduct Integrated Baseline Review 2 and Operational Test Readiness Review. Complete Integration Testing and start production on LRIP-2 (APN funded).<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Multi-System Integration | 32.131 | 35.124 | 49.148 | 0.000 | 49.148 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Multi-System Integration migrates from the previous Multi-Sensor Integration Phased approach and allows for insertion of new technologies and requirements to keep pace with rapidly evolving warfighter demands. Also, includes a naming convention change in regards to System Configuration Set (SCS) builds 27, 29 & 31. Initially all "X" labeled builds to include Block I Super Hornets, now 27, 29, & 31 will no longer include Super Hornets thus going back to a "C" SCS label designation to include only legacy A-D aircraft.<br>***FY 2016 Accomplishments:***<br>Multi-System Integration will continue efforts begun with Multi-Sensor Integration Phase III including system software design and development. Primary efforts will be software driven through the development, integration and testing of System Configuration Sets H12, H14 and H16. Decision Superiority gaps in Air Warfare will be addressed through the ongoing integration of weapons and sensors combined with display improvements to enhance air-to-surface, air-to-air and Counter Electronic Attack sensor integration. Upgrades to display firmware, display symbology, Crew Vehicle Interface improvements and air-to-air Mission Tactical Picture improvements. Development and Integration of Precision Approach Landing Capability with Civilian Interoperability functionality implemented through a combined hardware and software solution utilizing a Civilian Instrument Landing System and Space Based Augmentation System including a Multi-Mode Receiver and Space Based Augmentation System enabled GPS receiver. Continued updates to Wingman Compatability improvements such as Unique Identification and Enhanced Interference Blanking Unit and continued updates to Integrated Defensive Counter Measures suite of electronic warfare hardware.<br>***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Flight Plan Multi-System Integration (MSI) of capabilities continue through System Configuration Set (SCS) mission computer, Joint Mission Planning System Unique Planning Component, and weapon system software updates associated with each incremental Block (H build) software update. Decision Superiority gaps in Air and Surface Warfare will continue with ongoing integration of weapons and sensors combined with Display Improvements to enhance air-to-surface, air-to-air and Counter Electronic Attack sensor integration. Increase to engineering efforts for integration of active and passive kill chain capabilities and sensors associated with flight plan Naval Integrated Fires Control, for Over the Horizon Anti-Surface Warfare and Strike Accelerator target identification transition efforts. MSI algorithm and sensor developmental efforts also increase at test activities for ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Construct interoperability efforts.<br>***FY 2018 Base Plans:***<br>Flight Plan Multi-System Integration (MSI) of capabilities continues through mission computer, Joint Mission Planning System Unique Planning Component (JMPS UPC), and weapon system software System Configuration Set (SCS) updates associated with each incremental Block (H build) software update. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a Common Tactical Picture (CTP), Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan Naval Integrated Fire Control-Counter Air (NIFC-CA), Over the Horizon Anti-Surface Warfare (OASuW) and Strike Accelerator Future Naval Capability (FNC) Target Identification transition efforts continues. MSI algorithm and sensor developmental efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Constructive developmental efforts. Increased Test and Evaluation funding in FY18 provides funding to Commander Operational Test Forces (COTF) for MSI Operational Test (OT).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Flight Plan Engineering / System Configuration Set Development and Integration<br>***Articles:***<br>***Description:*** Continue F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability. Funding will support the development, test and integration efforts required to maintain tactical relevance in support of Navy Aviation Plan 2030. | 25.863<br>- | 26.956<br>- | 18.011<br>- | 0.000<br>- | 18.011<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy; Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance F/A-18 Cooperative Engagement Capability. Funding supports development (hardware and software), test and integration efforts for Flight Plan requirements such as Distributed Targeting Processor-Networked to include Aided Target Recognition, Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Strike Accelerator and Advanced Tactical Data Link; Display Improvements for enhanced sensor integration; Tactical Targeting Network Technology internet protocol capability; Flight Path Control (Magic Carpet); and Precision Approach and Landing Capability, in support of Integrated Capability Package 2 and 3. | | | | | |
| ***FY 2017 Plans:***<br>Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance F/A-18 Cooperative Engagement Capability. Funding supports (hardware and software), test and integration efforts for Flight Plan requirements such as Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Strike Accelerator and Advanced Tactical Data Link; Display Improvements for enhanced sensor integration; Tactical Targeting Network Technology internet protocol capability; Flight Path Control (Magic Carpet); and Precision Approach and Landing Capability, in support of Integrated Capability Package 2 and 3. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance F/A-18 Cooperative Engagement Capability. Funding supports (hardware and software), test and integration efforts for Flight Plan requirements such as Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Strike Accelerator and Advanced Tactical Data Link; Display Improvements for enhanced sensor integration; Tactical Targeting Network Technology internet protocol capability; Flight Path Control (Magic Carpet); and Precision Approach and Landing Capability, in support of Integrated Capability Package 2 and 3. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Test Wing Maintenance Conversion | 4.846 | 4.806 | 2.500 | 0.000 | 2.500 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Funding supports maintenance of aircraft at NAVAIR Test Wing used to support Program Office objectives.<br>***FY 2016 Accomplishments:***<br>Performed aircraft maintenance on Test Wing aircraft.<br>***FY 2017 Plans:***<br>Performed aircraft maintenance on Test Wing aircraft.<br>***FY 2018 Base Plans:***<br>Perform aircraft maintenance on Test Wing aircraft.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** F/A-18 Obsolescence Redesign | 0.700 | 1.000 | 0.100 | 0.000 | 0.100 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop and test modifications to address obsolescence issues.<br>***FY 2016 Accomplishments:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues.<br>***FY 2017 Plans:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues.<br>***FY 2018 Base Plans:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 weapon system and ancillary equipment obsolescence issues.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 106.905 | 67.886 | 69.759 | 0.000 | 69.759 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0143: *EA-18G* | 659.998 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12,707.707 |
| • APN/05250: *F-18 SERIES MOD* | 899.389 | 917.892 | 1,043.661 | - | 1,043.661 | 1,199.801 | 1,526.601 | 1,538.112 | 1,560.105 | 5,988.627 | 22,034.272 |
| • RDTEN/3063: *EA-18G DEVELOPMENT* | 45.384 | 116.761 | 173.488 | - | 173.488 | 152.520 | 68.097 | 68.651 | 53.812 | Continuing | Continuing |
| • APN/0145: *FA-18E/F* | 350.000 | 2,451.938 | 1,327.851 | - | 1,327.851 | 1,249.261 | 1,311.817 | 1,237.390 | 1,281.946 | 0.000 | 52,747.147 |
| • APN/0145C: *FA-18E/F* | 0.000 | 52.974 | 32.971 | - | 32.971 | 33.538 | 34.443 | 36.980 | 0.000 | 0.000 | 190.906 |

**Remarks**

**D. Acquisition Strategy**

The F/A-18 Improvement program consists of extensive spiral development efforts mapped out in the capability-based approach F/A-18 E/F "Flight Plan." These efforts are critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030.
The major programs within the F/A-18 Improvement project are based on six Weapon System Capabilities: Net Centric Operations/Battle Space Management, Sensor Integration, Air to Ground and Maritime Attack, and Air to Air Attack. The major efforts included in this project are: Dual Mode Weapons integration; an Infra-Red Search and Track Multi-System Integration; continued advanced development and F/A-18E/F Flight Plan engineering and analysis; continued enhanced software capabilities development; and engineering support to perform technical evaluations, modeling and simulations, and investigative flight testing.
- Infra-Red Search and Track (IRST). The IRST Block I/II program is a Navy program in the Engineering Manufacturing and Development (EMD) phase.
- Multi-System Integration. Multi-System Integration development is provided on a sole source cost plus fixed fee contract on a Research and Development Basic Ordering Agreement to Boeing.

**E. Performance Metrics**

IRST Program achieved MS B on 17 June 2011 and achieved MS C on 02 December 2014.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IRST - Primary Hardware Development Infra-Red Search and Track (IRST) | C/CPIF | Boeing : St. Louis, MO | 164.191 | 3.625 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 167.816 | 167.816 |
| IRST - Primary Development | Various | nsma : Various | 0.000 | 21.123 | Jul 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 21.123 | - |
| Multi System Integration - Develop Sensor Integration | C/IDIQ | Various : Various | 0.000 | 1.500 | Feb 2016 | 12.500 | Feb 2017 | 15.157 | Feb 2018 | - | | 15.157 | Continuing | Continuing | Continuing |
| Multi-System Integration Development Support | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 13.500 | Dec 2016 | 17.553 | Dec 2017 | - | | 17.553 | 0.000 | 31.053 | - |
| Multi-System Integration Development Support | WR | NAWCAD : Pax River, MD | 0.000 | 0.000 | | 5.000 | Dec 2016 | 9.659 | Dec 2017 | - | | 9.659 | 0.000 | 14.659 | - |
| Flight Plan / PALC(WAAS) | C/CPFF | Boeing : St. Louis, MO | 0.000 | 3.650 | Jul 2016 | 3.664 | Jul 2017 | 3.188 | Aug 2018 | - | | 3.188 | 0.000 | 10.502 | 10.502 |
| Flight Plan/SCS Development(Magic Carpet) | C/CPIF | GE : Various | 0.000 | 5.000 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.000 | 5.000 |
| Flight Plan/SCS Development | WR | NAWCAD : Pax River, MD | 4.331 | 1.820 | Jan 2016 | 5.496 | Dec 2016 | 1.000 | Dec 2017 | - | | 1.000 | 0.000 | 12.647 | - |
| Flight Plan/SCS Development (Magic Carpet) | C/CPIF | Boeing : St. Louis, MO | 0.000 | 7.433 | Jan 2016 | 11.454 | Dec 2016 | 4.500 | Dec 2017 | - | | 4.500 | 0.000 | 23.387 | 23.387 |
| Flight Plan/SCS Development | Various | DMEA : Various | 0.000 | 0.000 | | 0.000 | | 4.600 | Dec 2017 | - | | 4.600 | 0.000 | 4.600 | - |
| Prior Year Prod Dev cost no longer funded in FYDP | Various | Various : Various | 580.487 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 580.487 | - |
| | | **Subtotal** | 749.009 | 44.151 | | 51.614 | | 55.657 | | - | | 55.657 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>1662 / *F/A-18 Improvement* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IRST - Software (S/W) Development | WR | NAWCWD : China Lake, CA | 10.318 | 1.370 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.688 | - |
| IRST - Development Support | WR | NAWCWD : China Lake, CA | 6.894 | 0.332 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.226 | - |
| IRST - Development Support | WR | NAWCAD : Pax River, MD | 15.867 | 2.100 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 17.967 | - |
| IRST - Development Support | WR | NAWCAD : Lakehurst, NJ | 3.007 | 0.707 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.714 | - |
| IRST - Development Support | WR | FRC Southeast : Jacksonville, FL | 5.861 | 0.503 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.364 | - |
| Multi-System Integration Development Support | WR | NAWCAD : Pax River, MD | 3.250 | 2.113 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.363 | - |
| Multi-System Integration Development Support | WR | NAWCWD : China Lake, CA | 3.775 | 14.733 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 18.508 | - |
| Multi-System Integration Development Support | SS/IDIQ | Boeing : St. Louis, MO | 4.500 | 8.620 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 13.120 | 13.120 |
| Multi-System Integration Development Support | WR | NSMA : Arlington, VA | 2.300 | 2.300 | Mar 2016 | 2.300 | Mar 2017 | 1.679 | Mar 2018 | - | | 1.679 | Continuing | Continuing | Continuing |
| Flight Plan/System Configuration Set Development & Integration | WR | NAWCAD : Pax River, MD | 2.165 | 0.898 | Nov 2015 | 2.714 | Nov 2016 | 0.350 | Nov 2017 | - | | 0.350 | Continuing | Continuing | Continuing |
| Obsolescence Redesign | Various | Various : Various | 0.200 | 0.700 | Jun 2016 | 1.000 | Jun 2017 | 0.100 | Jun 2018 | - | | 0.100 | Continuing | Continuing | Continuing |
| Prior Year Support costs no longer funded in FYDP | Various | Various : Various | 3,022.595 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3,022.595 | - |
| | | **Subtotal** | 3,080.732 | 34.376 | | 6.014 | | 2.129 | | - | | 2.129 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IRST - Developmental Test & Evaluation (DT&E) | WR | NAWCAD : Pax River, MD | 16.633 | 1.100 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 17.733 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>1662 / *F/A-18 Improvement* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IRST - DT&E | WR | NAWCWD : China Lake, CA | 19.500 | 3.500 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 23.000 | - |
| IRST - Operational Test & Evaluation (OT&E) | WR | OPTEVFOR : VX-9 | 7.406 | 4.940 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 12.346 | - |
| Multi-System Integration | WR | OPTEVFOR : Norfolk, VA | 0.661 | 0.800 | Dec 2015 | 0.000 | | 5.100 | Dec 2017 | - | | 5.100 | Continuing | Continuing | Continuing |
| Flight Plan/SCS Test & Evaluation | WR | NAWCAD : Pax River, MD | 0.000 | 1.000 | Nov 2015 | 1.000 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 2.000 | - |
| AIM-120 Test Assets | MIPR | USAF : Eglin AFB, FL | 2.000 | 2.000 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.000 | - |
| Prior Year T&E costs no longer funded in FYDP | Various | Various : Various | 135.335 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 135.335 | - |
| | | **Subtotal** | 181.535 | 13.340 | | 1.000 | | 5.100 | | - | | 5.100 | - | - | - |

**Remarks**

Test Assets (AIM-120) procured as live fire test assets in support of F/A-18E/F Improvements programs (IRST, MSI (SCS block builds)) and weapons integration efforts specific to the F/A-18.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Mgmt Support - MISC | Various | NAWCAD : Pax River, MD | 14.205 | 2.100 | Dec 2015 | 0.659 | Dec 2016 | 0.659 | Dec 2017 | - | | 0.659 | Continuing | Continuing | Continuing |
| Seaport CSS - Program Management Support | C/CPFF | Wyle Lab : Pax River, MD | 21.324 | 3.442 | Mar 2016 | 2.626 | Dec 2016 | 2.603 | Dec 2017 | - | | 2.603 | 0.000 | 29.995 | 29.995 |
| Travel | Various | NAVAIR : Pax River, MD | 5.173 | 0.250 | Nov 2015 | 0.250 | Nov 2016 | 0.250 | Nov 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| Test Wing Maintenance Conversion | WR | NAWCAD : Pax River, MD | 30.157 | 2.423 | Dec 2015 | 2.403 | Dec 2016 | 1.250 | Dec 2017 | - | | 1.250 | Continuing | Continuing | Continuing |
| Test Wing Maintenance Conversion | WR | NAWCWD : China Lake, CA | 31.083 | 2.423 | Dec 2015 | 2.403 | Dec 2016 | 1.250 | Dec 2017 | - | | 1.250 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>1662 / *F/A-18 Improvement* | |

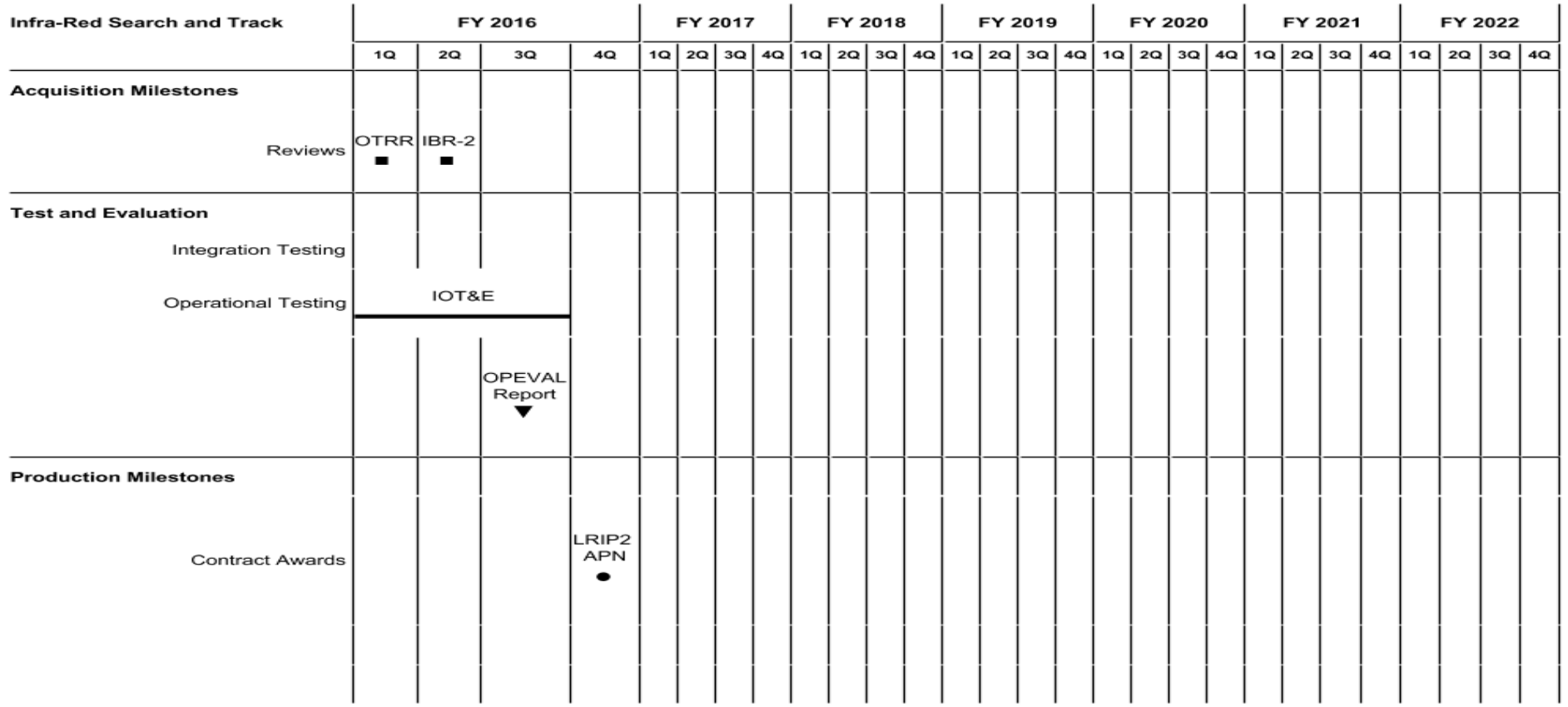
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flight Plan / System Configuration Set Development & Integration | WR | NAWCAD : Pax River, MD | 4.150 | 2.200 | Dec 2015 | 0.459 | Dec 2016 | 0.431 | Dec 2017 | - | | 0.431 | Continuing | Continuing | Continuing |
| Flight Plan / System Configuration Set Development & Integration | WR | NAWCWD : China Lake, CA | 4.150 | 2.200 | Dec 2015 | 0.458 | Dec 2016 | 0.430 | Dec 2017 | - | | 0.430 | Continuing | Continuing | Continuing |
| Prior Year Mgmt costs no longer funded in FYDP | Various | Various : Various | 64.986 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 64.986 | - |
| | | **Subtotal** | 175.228 | 15.038 | | 9.258 | | 6.873 | | - | | 6.873 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 4,186.504 | 106.905 | | 67.886 | | 69.759 | | - | | 69.759 | - | - | - |

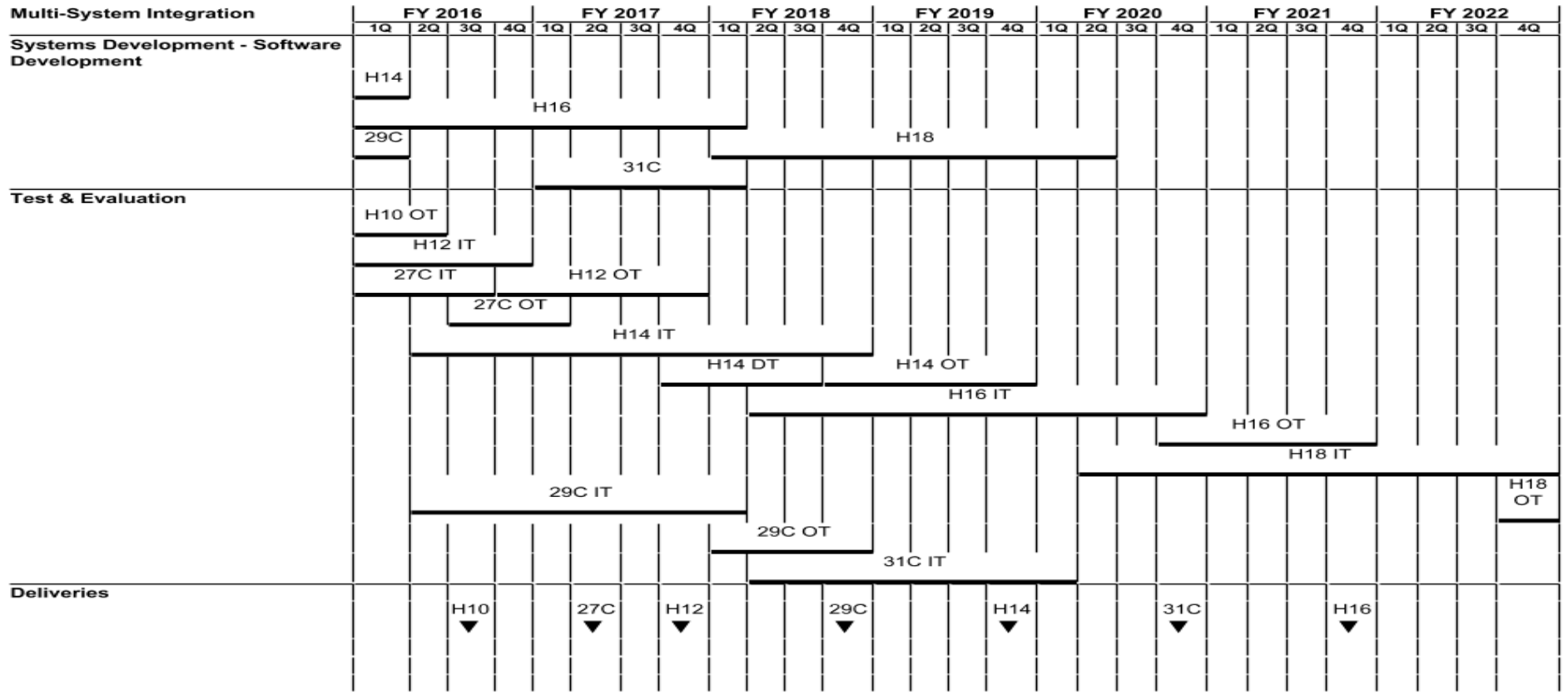
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |



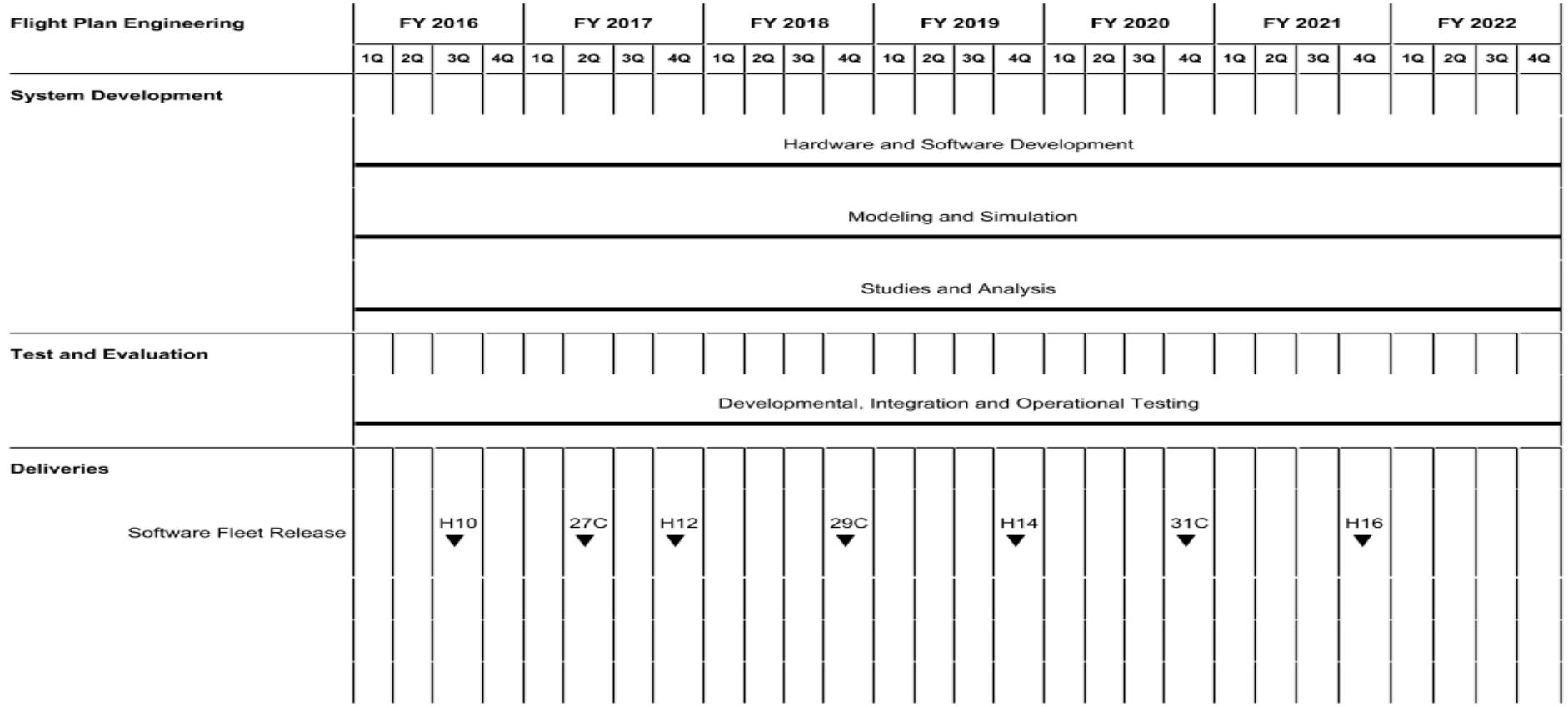

*2018PB - 0204136N - 1662*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |



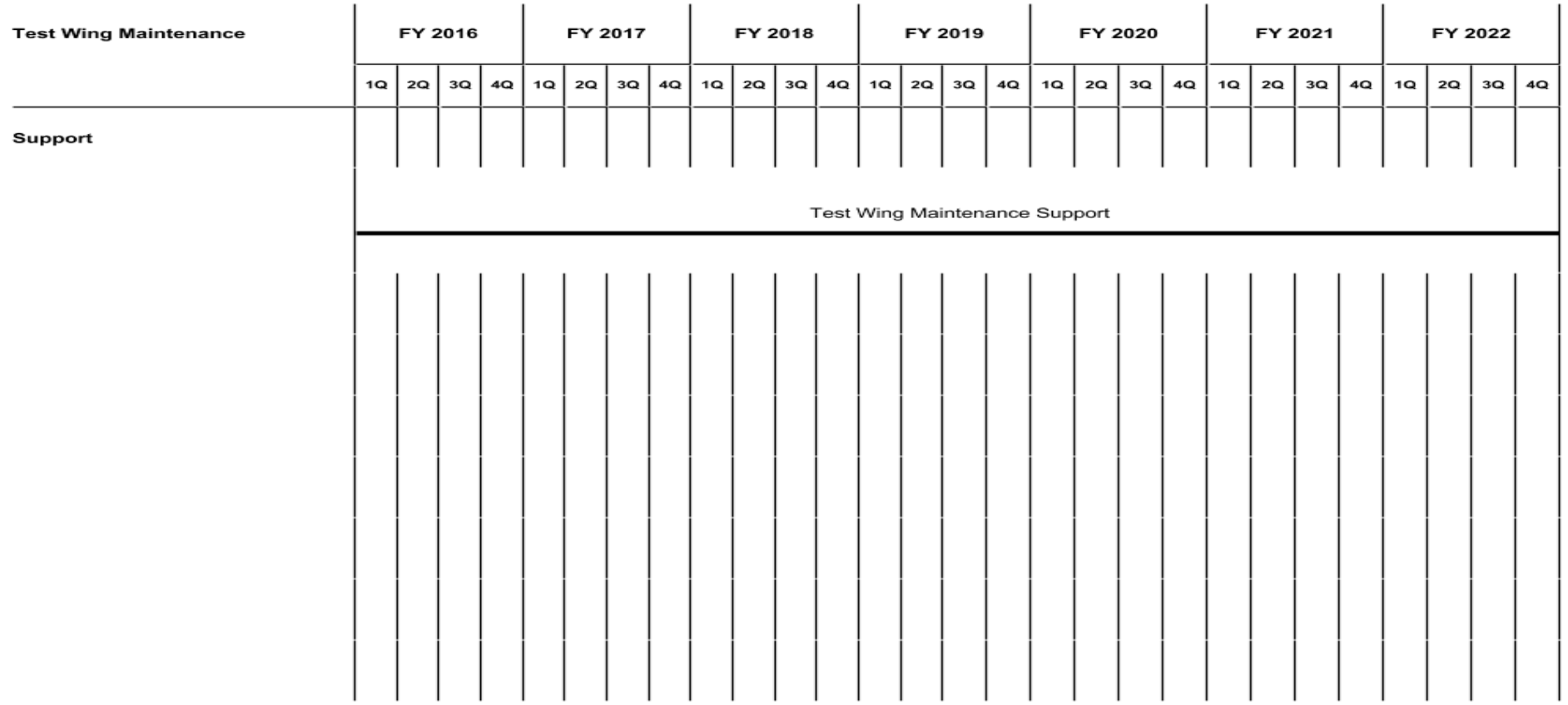

*2018PB - 0204136N - 1662*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |



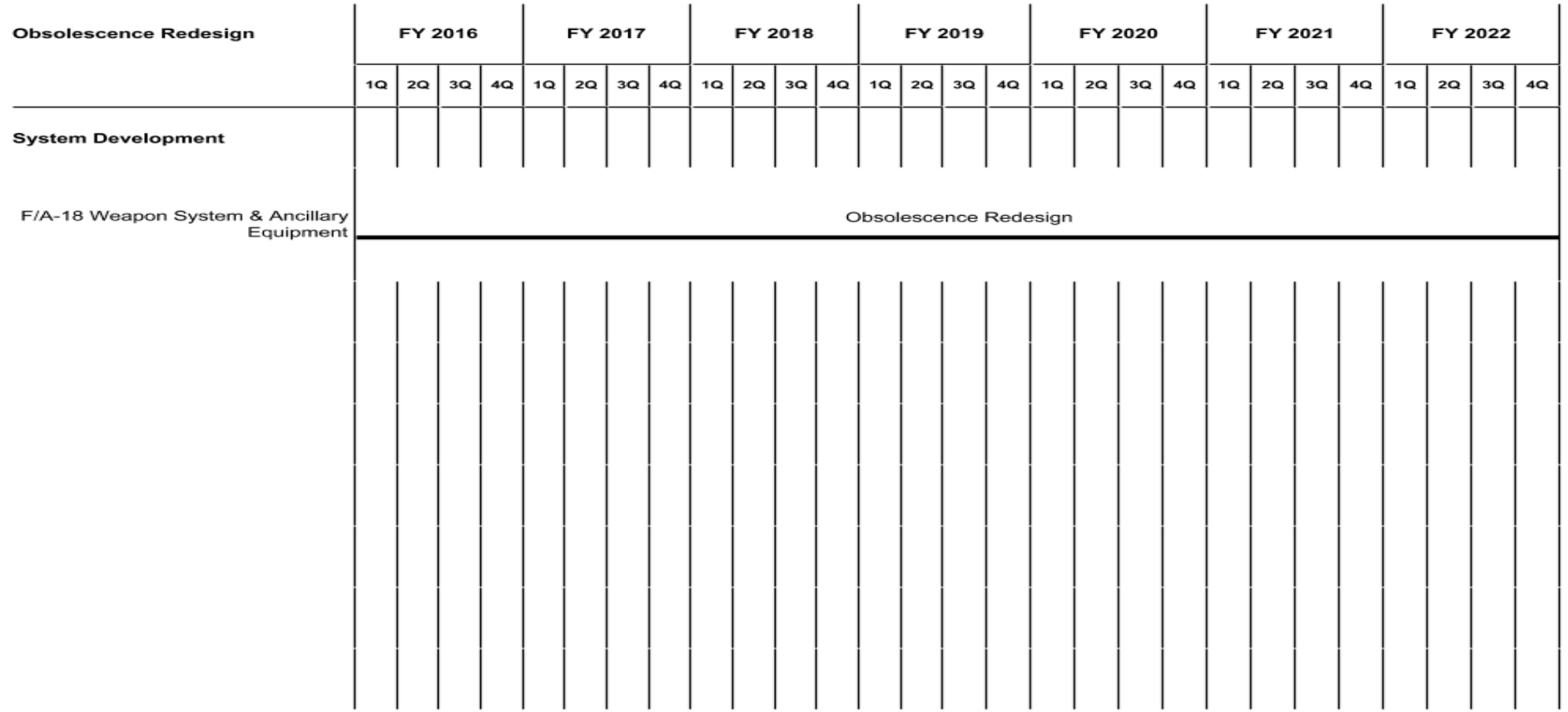

*2018PB - 0204136N - 1662*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |




*2018PB - 0204136N - 1662*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |




*2018PB - 0204136N - 1662*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Infra-Red Search and Track*** | | | | |
| Acquisition Milestones: Reviews: Integrated Baseline Review (IBR) - 2 | 2 | 2016 | 2 | 2016 |
| Acquisition Milestones: Reviews: Operational Testing Readiness Review (OTRR) | 1 | 2016 | 1 | 2016 |
| Test and Evaluation: Operational Testing: Integrated Operational Test & Evaluation (IOT&E) | 1 | 2016 | 3 | 2016 |
| Test and Evaluation: Operational Testing: OPEVAL Report | 3 | 2016 | 3 | 2016 |
| Production Milestones: Contract Awards: LRIP 2 APN | 4 | 2016 | 4 | 2016 |
| ***Multi-System Integration*** | | | | |
| Systems Development - Software Development: H14 Software Development | 1 | 2016 | 1 | 2016 |
| Systems Development - Software Development: H16 Software Development | 1 | 2016 | 1 | 2018 |
| Systems Development - Software Development: H18 Software Development | 1 | 2018 | 2 | 2020 |
| Systems Development - Software Development: 29C Software Development | 1 | 2016 | 1 | 2016 |
| Systems Development - Software Development: 31C Software Development | 1 | 2017 | 1 | 2018 |
| Test & Evaluation: H10 Operational Testing | 1 | 2016 | 2 | 2016 |
| Test & Evaluation: H12 Integration Testing | 1 | 2016 | 4 | 2016 |
| Test & Evaluation: H12 Operational Testing | 4 | 2016 | 4 | 2017 |
| Test & Evaluation: 27C Integration Testing | 1 | 2016 | 3 | 2016 |
| Test & Evaluation: 27C Operational Testing | 3 | 2016 | 1 | 2017 |
| Test & Evaluation: H14 Integration Testing | 2 | 2016 | 4 | 2018 |
| Test & Evaluation: H14 Developmental Testing | 4 | 2017 | 3 | 2018 |
| Test & Evaluation: H14 Operational Testing | 4 | 2018 | 4 | 2019 |
| Test & Evaluation: H16 Integration Testing | 2 | 2018 | 4 | 2020 |
| Test & Evaluation: H16 Operational Testing | 4 | 2020 | 4 | 2021 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Test & Evaluation: H18 Integration Testing | 2 | 2020 | 4 | 2022 |
| Test & Evaluation: H18 Operational Testing | 4 | 2022 | 4 | 2022 |
| Test & Evaluation: 29C Integration Testing | 2 | 2016 | 1 | 2018 |
| Test & Evaluation: 29C Operational Testing | 1 | 2018 | 4 | 2018 |
| Test & Evaluation: 31C Integration Testing | 2 | 2018 | 1 | 2020 |
| Deliveries: H10 Fleet Release | 3 | 2016 | 3 | 2016 |
| Deliveries: H12 Fleet Release | 4 | 2017 | 4 | 2017 |
| Deliveries: 27C Fleet Release | 2 | 2017 | 2 | 2017 |
| Deliveries: 29C Fleet Release | 4 | 2018 | 4 | 2018 |
| Deliveries: H14 Fleet Release | 4 | 2019 | 4 | 2019 |
| Deliveries: H16 Fleet Release | 4 | 2021 | 4 | 2021 |
| Deliveries: 31C Fleet Release | 4 | 2020 | 4 | 2020 |
| ***Flight Plan Engineering*** | | | | |
| System Development: Hardware and Software Development | 1 | 2016 | 4 | 2022 |
| System Development: Modeling and Simulation | 1 | 2016 | 4 | 2022 |
| System Development: Studies and Analysis | 1 | 2016 | 4 | 2022 |
| Test and Evaluation: Developmental, Integration and Operational Testing | 1 | 2016 | 4 | 2022 |
| Deliveries: Software Fleet Release: H10 Fleet Release | 3 | 2016 | 3 | 2016 |
| Deliveries: Software Fleet Release: H12 Fleet Release | 4 | 2017 | 4 | 2017 |
| Deliveries: Software Fleet Release: 27C Fleet Release | 2 | 2017 | 2 | 2017 |
| Deliveries: Software Fleet Release: 29C Fleet Release | 4 | 2018 | 4 | 2018 |
| Deliveries: Software Fleet Release: H14 Fleet Release | 4 | 2019 | 4 | 2019 |
| Deliveries: Software Fleet Release: H16 Fleet Release | 4 | 2021 | 4 | 2021 |
| Deliveries: Software Fleet Release: 31C Fleet Release | 4 | 2020 | 4 | 2020 |
| ***Test Wing Maintenance*** | | | | |
| Support: Test Wing Maintenance Support | 1 | 2016 | 4 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>1662 / *F/A-18 Improvement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Obsolescence Redesign*** | | | | |
| System Development: F/A-18 Weapon System & Ancillary Equipment: Obsolescence Redesign Development & Testing | 1 | 2016 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>2065 / *F/A-18 Radar Upgrade* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2065: *F/A-18 Radar Upgrade* | 711.982 | 14.552 | 13.926 | 8.018 | - | 8.018 | 7.158 | 8.951 | 8.961 | 9.147 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

F/A-18 Radio Detection and Ranging (RADAR) Upgrade: The F/A-18 RADAR Upgrade, Active Electronically Scanned Array (AESA) development program, which began in FY 1999, is the last of three pre-planned upgrades to the F/A-18 Type/Model/Series RADAR. The AESA system corrects operational test deficiencies noted in the AN/APG-73. It provides multi-target tracking, Synthetic Aperture RADAR (SAR) imagery, SAR Target Location Error (TLE), and improved spotlight map resolution. In addition, it provides greater lethality than previous F/A-18 RADARs by allowing full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons and it significantly increases A/A and A/G detection and tracking ranges. The AESA system provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy RADAR. This budget continues spiral capability development of AESA with increased efforts to address Phase II Operational Requirements Document requirements such as Counter-Electronic Attack(CEA) against multiple Radio Frequency Emitters, AESA Multi-Jammer Electronic Protection, Precision TLE Improvement, Monopulse and 5th/6th Channel development and Air Combat Maneuvering/Short Range Search and Track development and includes upgrades to RADAR Instrumentation, test and evaluation assets and threat assets, and upgraded modeling and simulation of both clean and Electronic Attack threat environments. Budget also supports development and testing of design modifications to address obsolescence issues with APG-65, APG-73 and APG-79 RADAR systems.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Distributed Targeting - CEA Software Development, Developmental Testing, Operational Testing, & Integration | 14.372 | 12.691 | 5.788 | 0.000 | 5.788 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Funding being utilized to support hardware (HW) and software (SW) capabilities development, integration and associated testing. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continue SW development, integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds program management and engineering support required for the APG-65/73-79 RADAR systems. | | | | | |
| ***FY 2017 Plans:***<br>Continue HW/SW development, integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds program management and engineering support required for the APG-65/73-79 RADAR systems. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2065 / *F/A-18 Radar Upgrade* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue HW/SW development, integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds engineering efforts associated with software development and integration of active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** F/A-18 RADAR Obsolescence Redesign<br>***Articles:***<br>***Description:*** Develop and test design modifications to address obsolescence issues.<br>***FY 2016 Accomplishments:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 RADAR system obsolescence issues.<br>***FY 2017 Plans:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 RADAR system obsolescence issues.<br>***FY 2018 Base Plans:***<br>Develop and test design modifications to hardware components and software systems in response to F/A-18 RADAR system obsolescence issues.<br>***FY 2018 OCO Plans:***<br>N/A | 0.180<br>- | 1.235<br>- | 2.230<br>- | 0.000<br>- | 2.230<br>- |
| **Accomplishments/Planned Programs Subtotals** | 14.552 | 13.926 | 8.018 | 0.000 | 8.018 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0143: *EA-18G* | 659.998 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12,707.707 |
| • APN/05250: *F-18 Series Mod (OSIP 002-07)* | 110.818 | 148.546 | 197.762 | - | 197.762 | 95.145 | 282.659 | 156.838 | 150.024 | 167.536 | 2,147.375 |
| • APN/0145: *FA-18E/F* | 350.000 | 2,451.938 | 1,327.851 | - | 1,327.851 | 1,249.261 | 1,311.817 | 1,237.390 | 1,281.946 | 0.000 | 52,747.147 |
| • APN/0145C: *FA-18E/F* | 0.000 | 52.974 | 32.971 | - | 32.971 | 33.538 | 34.443 | 36.980 | 0.000 | 0.000 | 190.906 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2065 / *F/A-18 Radar Upgrade* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

**D. Acquisition Strategy**

The Active Electronically Scanned Array program continues developmental efforts following a successful Full Rate Production milestone decision, after completing a two-phase Acquisition approach during the FY1999 through FY2007 timeframe. This strategy continues utilization of reform initiatives such as: early partnering with industry; leveraging industry investment; optimizing use of Commercial Off-The Shelf software and Non-Developmental Item; using Cost as an Independent Variable; and Electronic Data Deliverables. Basic Ordering Agreement orders for Request for Proposal developments are in place for Boeing, the airframe prime manufacturer/ integrator, and Raytheon, the Radio Detection and Ranging manufacturer, for focused risk reduction and sustainment of prior developmental activities.

**E. Performance Metrics**

Execute the system engineering process for software delivery and support the design and development of Electronic Protection, air to air, and air to ground capabilities.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>2069 / *F/A-18 Infrared Search and Track (IRST)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2069: *F/A-18 Infrared Search and Track (IRST)* | 0.000 | 0.000 | 107.313 | 86.993 | - | 86.993 | 132.892 | 109.919 | 48.320 | 5.729 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** P510

**A. Mission Description and Budget Item Justification**

F/A-18 Infra-Red Search and Track (IRST): The F/A-18 E/F IRST system is a passive long-wave Infra-Red (IR) sensor which provides an alternate fire control system in a high Electronic Attack / Radio Detection and Ranging (RADAR) denied environment. The IRST Block II Engineering Change Proposal (ECP) upgrades two Weapons Replaceable Assemblies (WRAs); the Infra-Red Receiver (IRR) and processor in order to provide full Capabilities Development Document (CDD) capability and enhanced warfighting capability through an improved engagement timeline, improved situational awareness, longer range passive detection and tracking and a larger field of regard with specification performance.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Infra-Red Search and Track (IRST) | 0.000 | 107.313 | 86.993 | 0.000 | 86.993 |
| ***Articles:*** | - | 6 | - | - | - |

***Description:*** Technology development and engineering and manufacturing development of an IRST sensor for the F/A-18 E/F. Block I supports technology development and engineering and manufacturing development of an IRST sensor for the F/A-18E/F to provide an alternate fire control system in a high Electronic Attack / Radio Detection and Ranging (RADAR) denied environment. Block II IRST upgrades the Infra-Red Receiver (IRR) and processor to provide full Capabilities Development Document (CDD) capability and enhanced warfighting capability through an improved engagement timeline, improved situational awareness, longer range passive detection and tracking and a larger field of regard with specification performance.

***FY 2016 Accomplishments:***
N/A

***FY 2017 Plans:***
Complete IRST Block II ECP Development Phase 1. Conduct IRST Block II ECP Preliminary Design Review. Begin IRST Block II ECP Development Phase 2, procure six IRST Block II EDMs (RDT&E funded). Continue

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2069 / *F/A-18 Infrared Search and Track (IRST)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| IRST Integration Testing. Begin Block I EDM conversion to Block II configuration. Award IRST Block I LRIP-3 production contract (APN funded).<br>***FY 2018 Base Plans:***<br>Continue IRST Block II ECP Development Phase 2. Continue Block I EDM conversion to Block II. Conduct Block II ECP Delta Critical Design Review. Continue IRST Integration Testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 107.313 | 86.993 | 0.000 | 86.993 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/05250: *F-18 Series Mod (OSIP 04-14)* | 95.706 | 5.320 | 3.655 | - | 3.655 | 86.270 | 88.200 | 181.340 | 211.140 | 488.732 | 1,228.048 |

**Remarks**

**D. Acquisition Strategy**

Infra-Red Search and Track (IRST). The IRST system is an evolutionary Navy acquisition program with Block I and Block II capabilities. The IRST Block I system developed by the Navy provides a basic capability, supported integration of the sensor onto a fuel tank and into the aircraft and supported aeromechanical flight test required for clearance and carrier qualification of the system. IRST Block I is in the Production and Deployment phase following a successful MS-C decision in December 2014 and will support continued integration with the F/A-18E/F Advanced Mission Computer software.

IRST Block II is an ECP to upgrade two WRAs that will provide full CDD capability. ECP development was begun in FY 2016 under Project Unit 1662 and continues in FY17 and beyond under Project Unit 2069. FY 2016 funded risk reduction activities and the program will execute a pre-development phase In Progress Review (IPR) 1 in 3Q17 and a pre-production IPR-2 in 2Q18 leading to a planned production (APN-5 funded) start in FY 2019 achieving Initial Operating Capability (IOC) in FY 2021.

**E. Performance Metrics**

IRST Program achieved MS B on 17 June 2011, achieved MS C on 02 December 2014. IRST Block II Pre-Development IPR-1 is scheduled for 3rd Quarter FY17; Pre-Production IPR-2 is scheduled for 2nd Quarter FY18. IRST Block II systems are scheduled to begin production in FY2019 and IOC in FY2021.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2069 / *F/A-18 Infrared Search and Track (IRST)* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Development (Hardware/Software) Infra-Red Search and Track (IRST) | Various | Boeing : St. Louis, MO | 0.000 | 0.000 | | 57.122 | Dec 2016 | 43.418 | Dec 2017 | - | | 43.418 | 206.813 | 307.353 | - |
| Hardware Development | MIPR | USAF (MIT) : Hanscom AFB, MA | 0.000 | 0.000 | | 1.500 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | Continuing | Continuing | Continuing |
| Software (S/W) Development | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 1.871 | Nov 2016 | 0.206 | Dec 2017 | - | | 0.206 | Continuing | Continuing | Continuing |
| IRST Support Equipment Development | WR | NAWCAD : Lakehurst, NJ | 0.000 | 0.000 | | 0.218 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| IRST Design Development | WR | FRC Southeast : Jacksonville, FL | 0.000 | 0.000 | | 0.917 | Nov 2016 | 0.944 | Nov 2017 | - | | 0.944 | Continuing | Continuing | Continuing |
| Primary Development | Various | NSMA : Various | 0.000 | 0.000 | | 32.938 | Nov 2016 | 33.712 | Nov 2017 | - | | 33.712 | 0.000 | 66.650 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 94.566 | | 79.280 | | - | | 79.280 | - | - | - |

**Remarks**

NAWCAD Lakehurst, New Jersey, is developing Support Equipment necessary to support the IRST pods.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 0.475 | Nov 2016 | 2.253 | Nov 2017 | - | | 2.253 | Continuing | Continuing | Continuing |
| Development Support | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 2.209 | Nov 2016 | 1.626 | Nov 2017 | - | | 1.626 | Continuing | Continuing | Continuing |
| Development Support | WR | NSWC : Indian Head, MD | 0.000 | 0.000 | | 0.060 | Dec 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Development Support | WR | NAWCWD : Pt. Mugu, CA | 0.000 | 0.000 | | 0.022 | Dec 2016 | 0.022 | Dec 2017 | - | | 0.022 | Continuing | Continuing | Continuing |
| Obsolescence Redesign | Various | Various : Various | 0.000 | 0.000 | | 0.250 | Dec 2016 | 0.250 | Dec 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 3.016 | | 4.151 | | - | | 4.151 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2069 / *F/A-18 Infrared Search and Track (IRST)* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation (DT&E) | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 0.889 | Nov 2016 | 1.196 | Nov 2017 | - | | 1.196 | Continuing | Continuing | Continuing |
| Developmental Test & Evaluation (DT&E) | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 2.077 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation (OT&E) | WR | OPTEVFOR : VX-9 | 0.000 | 0.000 | | 4.050 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation (OT&E) - CSS | Various | OPTEVFOR : VX-9 | 0.000 | 0.000 | | 0.247 | Dec 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation (OT&E) | WR | OPTEVFOR : Norfolk, VA | 0.000 | 0.000 | | 0.006 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation (OT&E) - CSS | Various | OPTEVFOR : Norfolk, VA | 0.000 | 0.000 | | 0.096 | May 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 7.365 | | 2.196 | | - | | 2.196 | - | - | - |

**Remarks**

Test Assets (AIM-120) procured as live fire test assets in support of F/A-18E/F Improvements programs (IRST, MSI (SCS block builds)) and weapons integration efforts specific to the F/A-18.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | Various | NAVAIR : Patuxent River, MD | 0.000 | 0.000 | | 0.020 | Oct 2016 | 0.020 | Oct 2017 | - | | 0.020 | Continuing | Continuing | Continuing |
| Program Management Support - MISC | Various | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 2.346 | Oct 2016 | 1.346 | Oct 2017 | - | | 1.346 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 2.366 | | 1.366 | | - | | 1.366 | - | - | - |

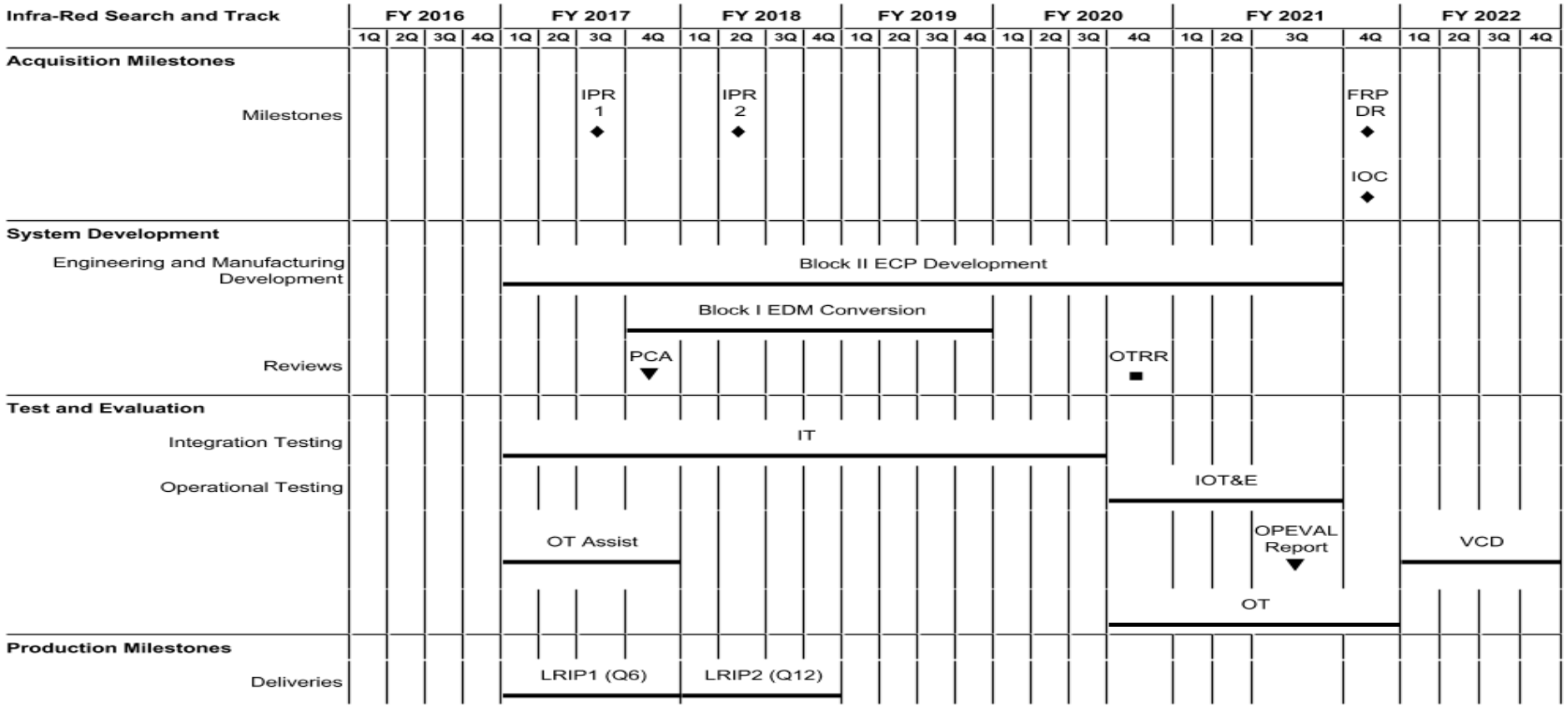
| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 107.313 | | 86.993 | | - | | 86.993 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>2069 / *F/A-18 Infrared Search and Track (IRST)* | |

| | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2069 / *F/A-18 Infrared Search and Track (IRST)* |




*2018PB - 0204136N - 2069*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2069 / *F/A-18 Infrared Search and Track (IRST)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Infra-Red Search and Track*** | | | | |
| Acquisition Milestones: Milestones: Full Rate Production Decision Review (FRP DR) | 4 | 2021 | 4 | 2021 |
| Acquisition Milestones: Milestones: Pre-development In Process Review (IPR 1) | 3 | 2017 | 3 | 2017 |
| Acquisition Milestones: Milestones: Pre-production In Process Review (IPR 2) | 2 | 2018 | 2 | 2018 |
| Acquisition Milestones: Milestones: IOC | 4 | 2021 | 4 | 2021 |
| System Development: Engineering and Manufacturing Development: Block II ECP Development | 1 | 2017 | 3 | 2021 |
| System Development: Engineering and Manufacturing Development: Block I EDM Conversion | 4 | 2017 | 4 | 2019 |
| System Development: Reviews: Operational Testing Readiness Review (OTRR) | 4 | 2020 | 4 | 2020 |
| System Development: Reviews: Physical Configuration Audit (PCA) | 4 | 2017 | 4 | 2017 |
| Test and Evaluation: Integration Testing: Integration Testing (IT) | 1 | 2017 | 3 | 2020 |
| Test and Evaluation: Operational Testing: Integrated Operational Test & Evaluation (IOT&E) | 4 | 2020 | 3 | 2021 |
| Test and Evaluation: Operational Testing: OPEVAL Report | 3 | 2021 | 3 | 2021 |
| Test and Evaluation: Operational Testing: Verification of Correction of Deficiencies | 1 | 2022 | 4 | 2022 |
| Test and Evaluation: Operational Testing: OT Assist | 1 | 2017 | 4 | 2017 |
| Test and Evaluation: Operational Testing: OT | 4 | 2020 | 4 | 2021 |
| Production Milestones: Deliveries: LRIP 1 (Lot 1 - Qty 6) | 1 | 2017 | 4 | 2017 |
| Production Milestones: Deliveries: LRIP 2 (Lot 2 - Qty 12) | 1 | 2018 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>2071 / *F/A-18 Block III* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2071: *F/A-18 Block III* | 0.000 | 0.000 | 0.000 | 59.700 | - | 59.700 | 84.600 | 89.900 | 30.700 | 0.000 | 0.000 | 264.900 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

F/A-18 Block III is a series of several of Engineering Change Proposals (ECPs) that bring several planned upgrades to the F/A-18E/F. The combined impact of these upgrades brings significant capability to the aircraft. Block III is a follow-on to Block II upgrades. The FY18 budget request funds Non-Recurring Engineering (NRE) for these ECPs which include Advanced Network Architecture, aircraft Signature Enhancements, Advanced Cockpit Displays, and Conformal Fuel tanks.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** F/A-18 Block III | 0.000 | 0.000 | 59.700 | 0.000 | 59.700 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Block III Super Hornet upgrades provide additional capability to the aircraft and its contribution to the Airwing are significant. The capability upgrades consist of several Engineering Change Proposals (ECPs) which will be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY18 budget request funds Non-Recurring (NRE) for these ECPs. | | | | | |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>F/A-18 Block III is a series of several of Engineering Change Proposals (ECPs) that bring several planned upgrades to the F/A-18E/F aircraft. The combined impact of these upgrades brings significant capability to the aircraft. The FY18 budget request funds the Non-Recurring (NRE) needed for these ECPs. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 59.700 | 0.000 | 59.700 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2071 / *F/A-18 Block III* |

**C. Other Program Funding Summary ($ in Millions)**

**Remarks**

**D. Acquisition Strategy**

A series of Block III Engineering Change Proposals (ECPs) are planned to be incorporated into production aircraft starting in FY19. The ECPs will provide capability upgrades to Block II aircraft to give them Block III capabilities. Block II Fleet aircraft (Lots 26 and up) will receive capability upgrades when inducted for Service Life Modification (SLM) events.

**E. Performance Metrics**

The PB18 budget request funds the Non-Recurring Engineering (NRE) for the Block III Engineering Change Proposals (ECPs) that will provide upgraded capabilities to the F/A-18 E/F aircraft. Block III capability upgrades is planned to be incorporated into the aircraft on the production line starting with the FY19 procurement. Block II aircraft will receive the Block III ECPs when the aircraft are inducted for Service Life Modification (SLM) events.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2071 / *F/A-18 Block III* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Block III primary development | Various | Boeing : St Louis MO | 0.000 | 0.000 | | 0.000 | | 58.700 | Dec 2017 | - | | 58.700 | 195.200 | 253.900 | 253.900 |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 58.700 | | - | | 58.700 | 195.200 | 253.900 | 253.900 |

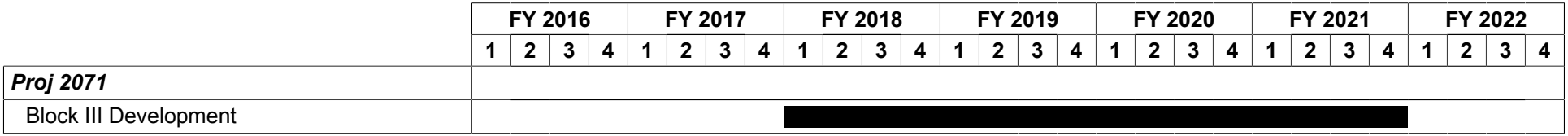
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 0.000 | | 1.000 | Dec 2017 | - | | 1.000 | 10.000 | 11.000 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 1.000 | | - | | 1.000 | 10.000 | 11.000 | - |

| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 59.700 | | - | | 59.700 | 205.200 | 264.900 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2071 / *F/A-18 Block III* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>2071 / *F/A-18 Block III* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2071*** | | | | |
| Block III Development | 1 | 2018 | 4 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204136N / *F/A-18 Squadrons* | Project (Number/Name)<br>9999 / *Congressional Adds* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9999: *Congressional Adds* | 9.868 | 11.448 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 21.316 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Congressional Add.

Research, Development, Test and Evaluation (RDT&E) funding to support the integration feasibility of the Brimstone II air-to-ground missile on the F/A-18E/F. This is the continuation of the Phase I assessment currently being conducted through funding provided in FY14. FY15 funding was for the continued qualification work and to assess software compatibility with the F/A-18E/F software configuration sets (SCS). Test and evaluation efforts are being conducted as required to qualify the missile to the Navy environment and to quantify missile performance. Brimstone II system functionality and response to stimuli will be measured in order to determine whether the missile is compatible with the F/A-18E/F in the current design. FY16 funding for continued qualification efforts. The FY16 RDTE Congressional increase for Dual Mode Brimstone Integration on the F/A-18 aircraft was executed for related Universal Armament Interface (UAI) efforts.

Research, Development, Test and Evaluation (RDTE) fund to support Universal Armament Interface (UAI) efforts. UAI implementation will bring the baseline standardized functionality to UAI compliant Air-to-Ground Type 1 weapons (standard launcher technology and enhanced functionality to UAI compliant Air-to-Ground Type 2 weapons (smart launcher technology)).

Noise Reduction study conducted by the University of Mississippi National Center for Physical Acoustics (NCPA).

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2016 | FY 2017 |
|---|---|---|
| ***Congressional Add:*** Dual Mode Brimstone Integration<br>***FY 2016 Accomplishments:*** N/A<br>***FY 2017 Plans:*** N/A | 10.000 | 0.000 |
| ***Congressional Add:*** Noise Reduction<br>***FY 2016 Accomplishments:*** N/A<br>***FY 2017 Plans:*** N/A | 1.448 | 0.000 |
| **Congressional Adds Subtotals** | 11.448 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204136N / *F/A-18 Squadrons* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |

**C. Other Program Funding Summary ($ in Millions)**

**Remarks**

**D. Acquisition Strategy**

Not Required for Congressional Adds.

**E. Performance Metrics**

Not Required for Congressional Adds.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204163N *I Fleet Tactical Development* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 161.026 | 39.548 | 48.225 | 33.525 | - | 33.525 | 22.541 | 19.579 | 2.664 | 2.721 | Continuing | Continuing |
| 0725: *Communication Automation* | 161.026 | 39.548 | 48.225 | 33.525 | - | 33.525 | 22.541 | 19.579 | 2.664 | 2.721 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Communication Automation Program is a continuing program that provides for automation and communications upgrades for fleet tactical users. It includes Battle Force Tactical Network (BFTN), Joint Aerial Layer Network-Maritime (JALN-M), High Frequency Over-the-horizon Robust Enterprise (HFORCE)and Automated Digital Network System (ADNS).

The Battle Force Tactical Network (BFTN) on each surface, subsurface, air, or fixed US Navy platform utilizes previously installed/existing Line of Sight (LOS)/Extended Line of Sight (ELOS) radios (a.k.a. Radio Frequency (RF)) to create a secure gateway that inter-connects all users into a common RF Tactical Network (a.k.a. wireless). This network separately supports US-Only and NATO Allied/Coalition users' tactical data information exchanges on each platform (node) between and/or across separately dispersed RF Networks even if Satellite Communications (SATCOM) channels to shore are lost during an Assured Command and Control (C2) and Anti-Access/Area Denial (A2/AD) event.

Joint Aerial Layer Network-Maritime (JALN-M), a system of systems (SoS) capability, is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access/Area Denial (A2/AD). With disruption or loss of space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document (ICD) and the JALN-M Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) waveform (Navy Multiband Terminal (NMT)) for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, a Positioning, Navigation, and Timing (PNT) capability will be developed and integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global Positioning System (GPS) connectivity. Because the Pod is being designed to operate in an A2/AD environment, the Pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via ADNS.

The current national focus on highly contested environments has highlighted the growing need for protected (anti-jam and low-probability of detection) communications. Projects such as JALN-M and High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) address capability gaps (network connectivity, network capacity, information and data sharing, network management) to enable assured communications in a satellite-denied environment. Although these projects will supplement and backup current capabilities, they may become the only communications paths available if satellite communications are completely denied. Navy is currently prototyping and demonstrating an aerial relay surrogate SATCOM communications capability under the JALN-M Project. The HFORCE Project will demonstrate resiliency and throughput enhancements via a hub-based HF communication architecture. HFORCE and JALN-M are very different approaches to

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204163N *I Fleet Tactical Development* |

solving the same problem: achieving assured communications in a satellite-denied environment. HFORCE will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required with seemingly opposing requirements for long range, high data rates, and low probability of detection (LPD). HFORCE will address the need for protected and reliable BLOS C4I in SATCOM denied environments where opportunities exist to leverage shore infrastructure to address the SATCOM-denied gap. HFORCE prototype has the potential to augment current space-based BLOS systems, providing an alternative capability in satellite-denied environments that is affordable, reliable and secure. The HFORCE project will address this gap by leveraging large gain hub arrays to enhance performance of HF links. Large gain hubs in concert with multi-carrier waveforms and adaptive scheduling provide Mbps-class data rates to large platforms and orders of magnitude improvement in LPD performance over traditional methods. Small scale demonstrations have focused on performance of system at the physical layer. HFORCE will focus on a larger scale prototype hub to be used with legacy waveforms and legacy radios.

Automated Digital Network System (ADNS) is the method by which Tactical Navy units transfer Internet Protocol (IP) data to Navy and Department of Defense communities on the Global Information Grid (GIG). ADNS is the gateway to tactical Wide Area Network (WAN) afloat for Internet Protocol network operations, supporting information dissemination and external connectivity. ADNS enables services and applications to interconnect to the Defense Information Systems Network (DISN) ashore via multiple Radio Frequency (RF) resources and pier connectivity.

FY18 BFTN efforts will focus on the completion and documentation of Initial Operational Test & Evaluation (IOT&E).

FY18 JALN-M efforts will focus on execution of the JALN-M demonstration flight tests which demonstrate Navy ship-to-ship/sub and ship/afloat-to-GIG communications via Airborne JALN-M Pod hosting Aerial Extended Data Rate (AXDR), High Capacity Backbone (HCB), and Assured PNT (Positioning, Navigation, and Timing) payloads. Results of the demonstration seeks to inform DoD and Navy leadership on the JALN way ahead (technical and programmatic risks) and of the viability of JALN-M as a future capability.

FY18 HFORCE efforts will use results from JALN-M resiliency studies to inform development of HFORCE demonstration plan and cost analysis, procurement of commercial off the shelf (COTS) hardware for installation of prototype half-scale hub, and initiate HF protected waveform (HFPW) development including interoperability with legacy waveforms. Additional FY18 efforts include programmatic documentation development (e.g. cost estimate, Project Definition Document (PDD)).

FY18 ADNS RDT&E investment will continue to support Interface Design Development (IDD) and integration with network applications, development of Line-Of-Sight (LOS) link, DISN integration, and development of Cipher-Text (CT) piers. ADNS development/integration will include addressing network management, intra and inter domain routing, Quality of Service (QoS), and Concept of Operations discussions. Continue Network-Based Cyber Security technology and virtualization to increase performance of the Navy's ADNS routing and transport architecture.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | **R-1 Program Element (Number/Name)**<br>PE 0204163N *I Fleet Tactical Development* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 41.538 | 48.225 | 8.437 | - | 8.437 |
| Current President's Budget | 39.548 | 48.225 | 33.525 | - | 33.525 |
| Total Adjustments | -1.990 | 0.000 | 25.088 | - | 25.088 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -1.000 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.990 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 24.937 | - | 24.937 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.151 | - | 0.151 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204163N / *Fleet Tactical Development* | Project (Number/Name)<br>0725 / *Communication Automation* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0725: *Communication Automation* | 161.026 | 39.548 | 48.225 | 33.525 | - | 33.525 | 22.541 | 19.579 | 2.664 | 2.721 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Battle Force Tactical Network (BFTN) on each surface, subsurface, air, or fixed US Navy platform uses previously installed/existing Line of Sight (LOS)/ Extended Line of Sight (ELOS) radios (a.k.a. Radio Frequency (RF)) to create a secure gateway that inter-connects all users into a common RF Tactical Network (a.k.a. wireless). BFTN enables war-fighters to digitally communicate NATO Allied/Coalition and US-Only information necessary to execute and plan in a real-time operational environment without relying on ashore application server interaction. This RF Network separately supports US-Only Carrier and Expeditionary Strike Group Commanders and maintains the digital communication ability to execute and plan with other U.S. ships, submarines or aircraft, as well as with NATO Allied/Coalition networks; even if Satellite Communication (SATCOM) channels to shore are lost. In a satellite-denied event, adversaries covertly jam or disable communications necessary to Fleet protection and tactical operation.

FY18 BFTN efforts will focus on the completion and documentation of Initial Operational Test & Evaluation (IOT&E).

Joint Aerial Layer Network-Maritime (JALN-M), a system of systems (SoS) capability, is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access/Area Denial (A2/AD). With disruption or loss of space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document (ICD) and the JALN-M Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) waveform (Navy Multiband Terminal (NMT)) for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, a Positioning, Navigation, and Timing (PNT) capability will be developed and integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global Positioning System (GPS) connectivity. Because the Pod is being designed to operate in an A2/AD environment, the Pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via ADNS.

FY18 JALN-M efforts will focus on execution of the JALN-M demonstration flight tests which demonstrate Navy ship-to-ship/sub and ship/afloat-to-GIG communications via Airborne JALN-M Pod hosting Aerial Extended Data Rate (AXDR), High Capacity Backbone (HCB), and Assured PNT (Positioning, Navigation, and Timing) payloads. Results of the demonstration seeks to inform DoD and Navy leadership on the JALN way ahead (technical and programmatic risks) and of the viability of JALN-M as a future capability.

The High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) project will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required with seemingly opposing requirements for long range, high data

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

rates, and low probability of detection (LPD). HForce will address the need for protected and reliable BLOS C4I in SATCOM denied environments where opportunities exist to leverage shore infrastructure to address the SATCOM-denied gap. Recent advances in High Frequency (HF) radio and digital signal processing technologies have increased performance, signal clarify and data transmission capabilities, rapidly making HF a viable option for terrestrial-based, long-range C4I. Digital Wideband HF has the potential to augment current space-based BLOS systems, providing an alternative capability in satellite-denied environments that is affordable, reliable and secure. The HForce project will address this gap by leveraging large gain hub arrays to enhance performance of HF links. Large gain hubs in concert with multi-carrier waveforms and adaptive scheduling provide Mbps-class data rates to large platforms and orders of magnitude improvement in LPD performance over traditional methods. Small scale demonstrations have focused on performance of system at the physical layer. HForce will focus on a larger scale prototype hub to be used with legacy waveforms and legacy radios.

FY18 HForce efforts will focus on the development of a demonstration plan and cost analysis, integration and test of 1/2 scale development hub, hardware procurement for half-scale demonstration hub, waveform development including interoperability with legacy waveforms, demonstrate waveform acquisition functionality, assessment of Program of Record (PoR) radios for integration with prototype waveform, preparation for POR transition.

Automated Digital Network System (ADNS) provides routing, switching, baseband, configuration and monitoring capabilities for interconnecting naval, coalition and joint enclaves worldwide. ADNS utilizes off the shelf equipment and network protocols as specified by the Joint Technical Architecture. ADNS INC III combines all Navy Tactical Voice, Secure Communications Interoperability Protocol (SCIP) Inter-Working Function, Video, and data requirements into a converged IP data stream. ADNS INC III supports higher bandwidth satellites, providing up to 25 mega bytes per second (Mbps) of throughput on Unit Level ships and up to 50 Mbps on Force Level ships. INC III architecture also incorporates an IPv4/IPv6 dual stack and Cipher-Text (CT) security architecture to align to the Global Information Grid (GIG) in order to mesh Navy Tactical surface, subsurface, and airborne platforms into a single IP environments with gateway functions to coalition and joint networks, in addition to greater security utilizing the High Assurance Internet Protocol Encryptor (HAIPE) devices. ADNS will serve as the Navy tactical interface for IP Networking for the JALN-M system. ADNS will investigate emerging technologies to integrate with additional Department of Defense C4I Programs to improve inter-strike group networking and extend the network to the tactical edge.

FY18 ADNS RDT&E investment will continue to support Interface Design Development (IDD) and integration with network applications, development of Line-Of-Sight (LOS) link, DISN integration, and development of CT piers. ADNS development will include addressing network management, intra and inter domain routing, QoS, and Concept of Operations discussions. Continue Network-Based Cyber Security technology and virtualization to increase performance of the Navy's ADNS routing and transport architecture.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Battle Force Tactical Network (BFTN) | 10.679 | 5.354 | 0.499 | 0.000 | 0.499 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Overall program efforts include investigation of emerging technologies through study, development and associated testing for feasibility of program insertion. The BFTN is the Navy's program of record for high-frequency internet protocol (HFIP) and UHF LOS subnet relay (SNR) communications. BFTN is the only Allied/ Coalition option, providing command and control in a non-SATCOM or SATCOM-denied anti-access area-denied | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| (A2AD) environment and serves as a primary backup for SIPRNET (Secret Internet Protocol Router Network) in the absence of satellite communications.<br><br>***FY 2016 Accomplishments:***<br>Continued to support to the Developmental Test/Integrated Test (DT/IT) event in support of a Full Rate Production (FRP) decision. Supported channel allocation/saturation studies; designed specifications for High Frequency (HF) and Ultra High Frequency (UHF) radio wideband modification kit and radio feasibility studies; planned for environmental and shock/vibe testing; and developmental and demonstration test activities.<br><br>***FY 2017 Plans:***<br>Finalize DT/IT test documentation/plans. Complete system installations on test platforms. Complete the Operational Test Readiness Review. Continue preparations for Initial Operational Test & Evaluation (IOT&E) event in support of a full rate production decision. Continue to develop engineering solutions for end of life issues, obsolescence, and increase system ease of use for operators.<br><br>***FY 2018 Base Plans:***<br>Complete and finalize the IOT&E event, resulting reports and documentation in support of a full rate production decision. Adjudicate any developmental issues identified during IOT&E.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Joint Aerial Layer Network -Maritime (JALN-M)<br>***Articles:***<br><br>***Description:*** Current threats being pursued by peer adversaries have demonstrated an ability to deny US Forces satellite communications. In the absence of satellite communications, JALN-M is a system that can provide high capacity anti-jam communications to naval forces by utilizing aerial relays. The FY18 demonstration will complete the proof-of-concept.<br><br>***FY 2016 Accomplishments:***<br>FY16 efforts included procurement of the hardware for the two surrogate satellite prototypes. Continued design and development of JALN-M end-to-end system. Completed component and system of systems (SoS) Critical Design Review (CDR). Continued Airborne XDR development. Completed PNT subsystem and PRS development. Began pod subsystem integration and test of eight HCB air systems, and Airborne XDR. Continued Assured PNT subsystem integration and test with the pods. Continued development of the JALN-M Provider Edge Router for air and surface nodes. Completed design and integration of HCB ground systems, | 25.422<br>- | 40.084<br>- | 7.097<br>- | 0.000<br>- | 7.097<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| and equipment procurement for Mobile Ground Entry Point (MGEP) and shipboard terminals. Completed component integration of Topology Manager for airborne PRS, NMT, and HCB systems. Began integration and installation of MGEP at Naval Undersea Warfare Center (NUWC) for emulated CVN and emulated SSN. Delivered production HCB systems for MGEP, and shipboard terminals. Additional efforts included planning activities and the development of systems engineering documentation in support of the JALN-M Pod flight tests. Continued coordination efforts with Navy Authorizing Official (NAO) toward obtaining Interim Authority to Test (IATT) approval for test phase. | | | | | |
| ***FY 2017 Plans:***<br>FY17 efforts include procurement, integration, and test of the Joint Aerial Layer Network-Maritime (JALN-M) end-to-end system in preparation for 30 flight tests. Complete component integration for Airborne XDR Deliver two pod prototypes and four HCB terminals. Begin system integration for pod prototypes, HCB, and Airborne XDR. Procure 14 radios for Position Reporting System (PRS) and continue system integration of PRS with shipboard systems and airborne payloads. Complete MGEP installation at Naval Support Activity (NSA) Northwest Annex and begin shipboard installations of Topology Manager on one aircraft carrier (CVN) and three Destroyer Guided Missiles (DDGs). Begin hardware and software installations of QNT radios on three DDGs and one CVN. Begin hardware and software installations of HCB on one CVN. Begin Electromagnetic Interference (EMI) testing to determine topside equipment installation position for underway DDG. Complete Integration and Test Readiness Review (ITRR), Installation Readiness Review (IRR), and Pre-Demo Flight Readiness Review (RR). | | | | | |
| ***FY 2018 Base Plans:***<br>FY18 efforts include all planning and execution activities to conduct the JALN-M demonstration test flights. Complete installation of shipboard systems (ADNS and NMT) and MGEP (DJC2) at NAVSATCOMFAC Teleport Northwest. Efforts include In-Service Engineering Activity (ISEA) (ADNS and DJC2) and Subject Matter Expert (SME) support (GCCS-M) for Information Exchange Requirements (IERs) in support of the demonstration flight test. Submit IATT request and obtain NAO approval of IATT to continue lab based testing and commencement of shipboard testing. Demonstration flight test will be executed in four phases. Phase 1 will include localized testing of Pod capabilities against emulated platforms at NUWC. Phase 2 will include extended Pod testing at NUWC with connection to live shore networks. Phase 3 will include extended testing of Pod with Fleet platforms at Norfolk, VA with ships pierside at Naval Station, Norfolk, VA. Phase 4 will include the full JALN-M architecture flight testing of two Pods, supporting two Strike Groups (Norfolk and Naval Undersea Warfare Center), connecting to Fleet Network Operations Center (FLTNOC) for representative operational demonstration. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Following completion of flight tests, additional efforts include deinstallation of all shipboard installations and submittal of post demonstration analysis report to OSD.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** High Frequency Over-the-horizon Robust Enterprise (HFORCE)<br>***Articles:*** | 0.000<br>- | 0.000<br>- | 25.000<br>- | 0.000<br>- | 25.000<br>- |
| ***Description:*** High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required with seemingly opposing requirements for long range, high data rates, and low probability of detection (LPD). HFORCE will address the need for protected and reliable BLOS C4I in SATCOM denied environments where opportunities exist to leverage shore infrastructure to address the SATCOM-denied gap. HFORCE prototype has the potential to augment current space-based BLOS systems, providing an alternative capability in satellite-denied environments that is affordable, reliable and secure. HFORCE project will address this gap by leveraging large gain hub arrays to enhance performance of HF links. Large gain hubs in concert with multi-carrier waveforms and adaptive scheduling provide Mbps-class data rates to large platforms and orders of magnitude improvement in LPD performance over traditional methods. Small scale demonstrations have focused on performance of system at the physical layer. HFORCE will focus on a larger scale prototype hub to be used with legacy waveforms and legacy radios.<br><br>***FY 2016 Accomplishments:***<br>N/A<br><br>***FY 2017 Plans:***<br>N/A<br><br>***FY 2018 Base Plans:***<br>FY18 High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) efforts will use results from JALN-M resiliency studies to inform development of HFORCE demonstration plan and cost analysis, procurement of commercial off the shelf (COTS) hardware for installation of prototype half-scale hub, and initiate HF protected waveform (HFPW) development including interoperability with legacy waveforms. Additional FY18 efforts include programmatic documentation development (e.g. cost estimate, Project Definition Document (PDD)), identifying shore sites for demonstration, develop Security Classification Guide, conduct technical studies necessary to specify systems and design requirements, identify impacts to current demonstration | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| plan and identify needs for test environments for half-scale demonstration sites. Conduct quarterly In-Process Reviews (IPR).<br><br>HFORCE studies will be conducted to assess and analyze use of High Frequency Global Communications System (HFGCS) and alternative shore systems in place of array for transmit and receive; topside HF antennas; Automated Digital Network System (ADNS) interface to HFORCE prototype system and shipboard HF system, including Digital Mobile Radio (DMR) and Battle Force Tactical Network (BFTN). Conduct analysis of application performance and shipboard architecture; independent anti-jam and Low Probability of Detection (LPD) analysis of new HF waveform and ancillary equipment needed for HFORCE prototype implementation. Cost analyses will be conducted to determine cost needed to improve shipboard HF systems.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Automated Digital Network System (ADNS)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Continued testing and interfaced with Enterprise Network Management System (ENMS), IPv6 transition, and integration of Super High Frequency (SHF). Continued the Interface Design Development (IDD) and integration with network applications, developed Line-Of-Sight (LOS) link, Defense Information System Network (DISN) integration and development of Cipher-Text (CT) Piers. Investigated and recommended platform network devices, network design support to include procurement, integration and testing of the Wide Area Network (WAN) and Joint Aerial Layer Network-Maritime (JALN-M) system. Commenced network-based Cyber Security technology and virtualization of ADNS.<br>***FY 2017 Plans:***<br>Continue testing and interfaces with ENMS, IPv6 transition, and integration of SHF. Continue the IDD and integration with network applications, develop LOS link, DISN integration and development of CT Piers. Investigate and recommend platform network devices, network design support to include procurement, integration and testing of the WAN and JALN-M system. Complete JALN-M development and test events. Continue network-based Cyber Security technology and virtualization of ADNS.<br>***FY 2018 Base Plans:***<br>Continue testing and interfaces with ENMS, IPv6 transition, and integration of SHF. Continue the IDD and integration with network applications, develop LOS link, DISN integration and development of CT Piers. Investigate and recommend platform network devices, network design support to include procurement, | 3.447<br>- | 2.787<br>- | 0.929<br>- | 0.000<br>- | 0.929<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| integration and testing of the WAN. Continue network-based Cyber Security technology and virtualization of ADNS.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 39.548 | 48.225 | 33.525 | 0.000 | 33.525 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/3057: *Battle Force Tactical Network (BFTN).* | 3.675 | 3.706 | 1.078 | - | 1.078 | 1.076 | 2.616 | 4.452 | 4.451 | Continuing | Continuing |
| • OPN/3050: *Automated Digital Network System (ADNS)* | 50.561 | 43.778 | 50.366 | - | 50.366 | 58.057 | 57.420 | 58.651 | 59.824 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Battle Force Tactical Network (BFTN) - Completion of Initial Operational Test & Evaluation (IOT&E) will lead to a Full Rate Production (FRP) decision enabling the program to move forward with fielding additional systems.

Joint Aerial Layer Network-Maritime (JALN-M) will address capability gaps as directed by the JALN Analysis of Alternatives (AoA) by integrating a suite of technical capabilities into a single payload. Technical and acquisition support will be provided to conduct High Capacity Backbone (HCB) and Airborne Extended Data Rate (XDR) demonstrations and to develop two prototype JALN-M payloads.

High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) will address the need for protected and reliable beyond line of sight (BLOS) C4I in SATCOM-denied environments where opportunities exist to leverage shore or shipboard infrastructure to address the SATCOM-denied gap. HFORCE will address capability gaps identified during JALN-M prototype development by conducting studies to inform development of HFORCE prototype system. Technical and acquisition support will be provided to conduct BLOS HF demonstration and develop HF shore hub and HF protected waveform (HFPW).

Automated Digital Network System (ADNS): Evolutionary acquisition approach with overlapping development and implementation phases for defined INC I, II, and III baselines. INC I, II, and III will use competitively awarded contracts to implement changes consistent with acquisition initiatives. ADNS leverages Commercial-Off-The-Shelf (COTS) and Government Off-the-Shelf (GOTS) products while capitalizing on acquisition reform initiatives to achieve material savings in the logistics, installation, integration and training areas. Where feasible, differing types of advantageous contract vehicles will be used to provide flexibility, decrease contract administrative costs, and encourage acquisition streamlining through the use of COTS/GOTS products.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

**E. Performance Metrics**

BFTN - Complete Initial Operational Test and Evaluation (IOT&E) to determine the Operational Effectiveness and Operational Suitability of the BFTN AN/USQ-195(V)1 surface variant, when employed in its intended operational environment. This event will evaluate the capability of BFTN against its intended threats in threat-representative environments. Performance will be evaluated against defined and derived performance criteria listed in the BFTN Test and Evaluation Master Plan (TEMP). The determination of performance in specific environments, or against a specific category of threats, will provide consideration for system employment in future combat operations and contribute to the incremental improvement of future BFTN designs. The IOT&E will focus on employment of BFTN and its Command, Control and Communications (C3) capabilities in a disadvantaged communications environment (i.e., no satellite or other high-bandwidth connections available).

HFORCE - Complete technical studies, procure prototype hardware for half-scale hub, initial development stages of high frequency protected waveform (HFPW).

ADNS - Included in the ADNS program goals are the improvements to bandwidth throughput, connectivity to multiple Radio Frequency (RF) paths, greater security, and system capability delivered within a smaller form factor. The ADNS program will, at a minimum, provide bandwidth throughput enhancements resulting in an increase from 2 megabytes per
second (Mbps) to 25/50 Mbps. ADNS will also provide the ability to transport data across multiple paths simultaneously vice the current limitations of single or secondary paths. ADNS will provide greater security posture by encrypting each enclave, increase performance of the routing and transport architecture while reducing physical footprint and cost, and securing the core via Cipher-Text.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204163N / *Fleet Tactical Development* | Project (Number/Name)<br>0725 / *Communication Automation* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | Various | Various : Various | 50.479 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 50.479 | - |
| Systems Engineering-ADNS | WR | SSC : PAC/LANT | 22.389 | 1.200 | Dec 2015 | 1.769 | Dec 2016 | 0.558 | Dec 2017 | - | | 0.558 | Continuing | Continuing | Continuing |
| Systems Engineering-ADNS | WR | NUWC : Newport, RI | 1.864 | 1.136 | Dec 2015 | 0.647 | Dec 2016 | 0.184 | Dec 2017 | - | | 0.184 | Continuing | Continuing | Continuing |
| System Engineering-ADNS | C/CPFF | NUWC : Newport, RI | 0.000 | 0.110 | Jul 2016 | 0.145 | Mar 2017 | 0.046 | Mar 2018 | - | | 0.046 | 0.000 | 0.301 | - |
| Intergration and Test-ADNS | C/CPFF | SSC : PAC | 0.000 | 0.000 | | 0.132 | Mar 2017 | 0.046 | Mar 2018 | - | | 0.046 | 0.000 | 0.178 | - |
| Primary Hardware/ Software - HFORCE | C/FFP | MIT/Lincoln Lab : Lexington MA | 0.000 | 0.000 | | 0.000 | | 23.000 | Nov 2017 | - | | 23.000 | 0.000 | 23.000 | - |
| Primary Hardware Dev.-JALN-M | WR | NSWC : Panama City, FL | 0.695 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.695 | - |
| System Engineering JALN-M | MIPR | DTIC : Ft. Belvoir, VA | 0.000 | 0.000 | | 0.000 | | 1.500 | Nov 2017 | - | | 1.500 | 0.000 | 1.500 | - |
| Primary Hardware/ Software - JALN-M | C/FFP | MIT/Lincoln Lab : Lexington MA | 27.404 | 21.251 | Nov 2015 | 32.179 | Nov 2016 | 1.796 | Nov 2017 | - | | 1.796 | 0.000 | 82.630 | - |
| System Engineering JALN-M | C/CPFF | STF : San Diego,CA | 2.027 | 1.303 | Nov 2015 | 2.064 | Nov 2016 | 0.800 | Nov 2017 | - | | 0.800 | 0.000 | 6.194 | - |
| System Enginering JALN-M | WR | SSC : PAC | 1.927 | 1.200 | Jan 2016 | 1.111 | Jan 2017 | 1.851 | Nov 2017 | - | | 1.851 | 0.000 | 6.089 | - |
| System Enginering JALN-M | WR | NAWCAD : Patuxent River, MD | 1.200 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.200 | - |
| System Engineering BFTN | WR | SSC : PAC | 1.784 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.784 | - |
| Primary HW/SW Dev BFTN | WR | SSC : PAC | 0.326 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.326 | - |
| System Engineering BFTN | WR | SSC : LANT JICF | 0.129 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.129 | - |
| System Engineering BFTN | C/CPFF | STF : San Diego,CA | 0.441 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.441 | - |
| Primary Hardware BFTN | SS/CPIF | Metasoft : San Diego, CA | 3.460 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.460 | - |
| Primary Software Dev BFTN | SS/BA | SSC : PAC | 2.182 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.182 | - |
| System Engineering BFTN | WR | SSC : LANT | 0.512 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.512 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204163N / *Fleet Tactical Development* | Project (Number/Name)<br>0725 / *Communication Automation* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intergration and Test-ADNS | WR | SSC : LANT | 0.000 | 0.553 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| System Engineering BFTN | WR | SSC : PAC JICF | 0.055 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.055 | - |
| System Engineering-ADNS | C/CPFF | BAH : San Diego, CA | 0.000 | 0.310 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 116.874 | 27.063 | | 38.047 | | 29.781 | | - | | 29.781 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support | Various | Various : Various | 10.358 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.358 | - |
| System Engineering BFTN | WR | SSC : LANT | 0.000 | 0.586 | Feb 2016 | 0.306 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.892 | - |
| System Engineering BFTN | C/CPFF | STF : San Diego, CA | 0.000 | 0.713 | Jun 2016 | 0.235 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.948 | - |
| Travel - JALN-M | WR | PMW 170 : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.050 | Dec 2017 | - | | 0.050 | 0.000 | 0.050 | - |
| Studies and Analysis BFTN | WR | SSC : PAC | 0.468 | 0.120 | Apr 2016 | 0.016 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.604 | - |
| Development Support - HFORCE | WR | SSC : San Diego,CA | 0.000 | 0.000 | | 0.000 | | 0.850 | Nov 2017 | - | | 0.850 | 0.000 | 0.850 | - |
| System Engineering BFTN | WR | SSC : PAC | 0.000 | 0.842 | Aug 2016 | 0.470 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.312 | - |
| Logistics Support BFTN | C/CPFF | CSA : San Diego, CA | 0.329 | 0.107 | Nov 2015 | 0.363 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.799 | - |
| Development Support - JALN-M | C/CPFF | BAH : San Diego | 3.462 | 0.550 | Dec 2015 | 1.375 | Dec 2016 | 0.850 | Dec 2017 | - | | 0.850 | 0.000 | 6.237 | - |
| Development Support - JALN-M | C/CPFF | Mitre : San Diego, CA | 0.841 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.841 | - |
| Development Support - JALN-M | WR | SSC : PAC | 2.348 | 0.623 | Nov 2015 | 2.566 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 5.537 | - |
| Development Support - JALN-M | C/CPFF | Linquest : San Diego, CA | 0.300 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.300 | - |
| Financial Management Support - JALN-M | C/CPFF | Artemis : San Diego, CA | 0.436 | 0.275 | Oct 2015 | 0.422 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.133 | - |
| Documentation BFTN | C/CPFF | BAH : San Diego, CA | 0.202 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.202 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204163N / *Fleet Tactical Development* | Project (Number/Name)<br>0725 / *Communication Automation* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Certification Authority-ADNS | C/CPFF | BAH : San Diego,CA | 0.000 | 0.138 | Jan 2016 | 0.094 | Jan 2017 | 0.095 | Jan 2018 | - | | 0.095 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 18.744 | 3.954 | | 5.847 | | 1.845 | | - | | 1.845 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation | Various | Various : Various | 14.512 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 14.512 | - |
| Integration and Test BFTN | C/FFP | COMOPTEVOR : Norfolk, VA | 0.745 | 0.954 | Aug 2016 | 0.520 | Dec 2017 | 0.050 | Mar 2018 | - | | 0.050 | 0.000 | 2.269 | - |
| Test and Evaluation Support BFTN | WR | SSC : PAC | 1.047 | 5.674 | Sep 2016 | 2.544 | Dec 2016 | 0.449 | Dec 2017 | - | | 0.449 | 0.000 | 9.714 | - |
| Developmental Test and Evaluation-JALN-M | C/CPFF | JHU/APL : Laurel, MD | 1.400 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.400 | - |
| Developmental Test and Evaluation-JALN-M | C/CPFF | MIT/Lincoln Lab : Lexington, MA | 5.812 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.812 | - |
| Test and Evaluation Support BFTN | WR | SSC : LANT | 0.362 | 0.891 | Sep 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.253 | - |
| | | **Subtotal** | 23.878 | 7.519 | | 3.064 | | 0.499 | | - | | 0.499 | 0.000 | 34.960 | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support - HFORCE | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.600 | Nov 2017 | - | | 0.600 | 0.000 | 0.600 | - |
| Program Management Support - JALN | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.250 | Nov 2017 | - | | 0.250 | 0.000 | 0.250 | - |
| Program Management Support - BFTN | C/CPFF | BAH : San Diego, CA | 1.130 | 0.792 | Nov 2015 | 0.900 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 2.822 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204163N / *Fleet Tactical Development* | Project (Number/Name)<br>0725 / *Communication Automation* | |

**Management Services ($ in Millions)**

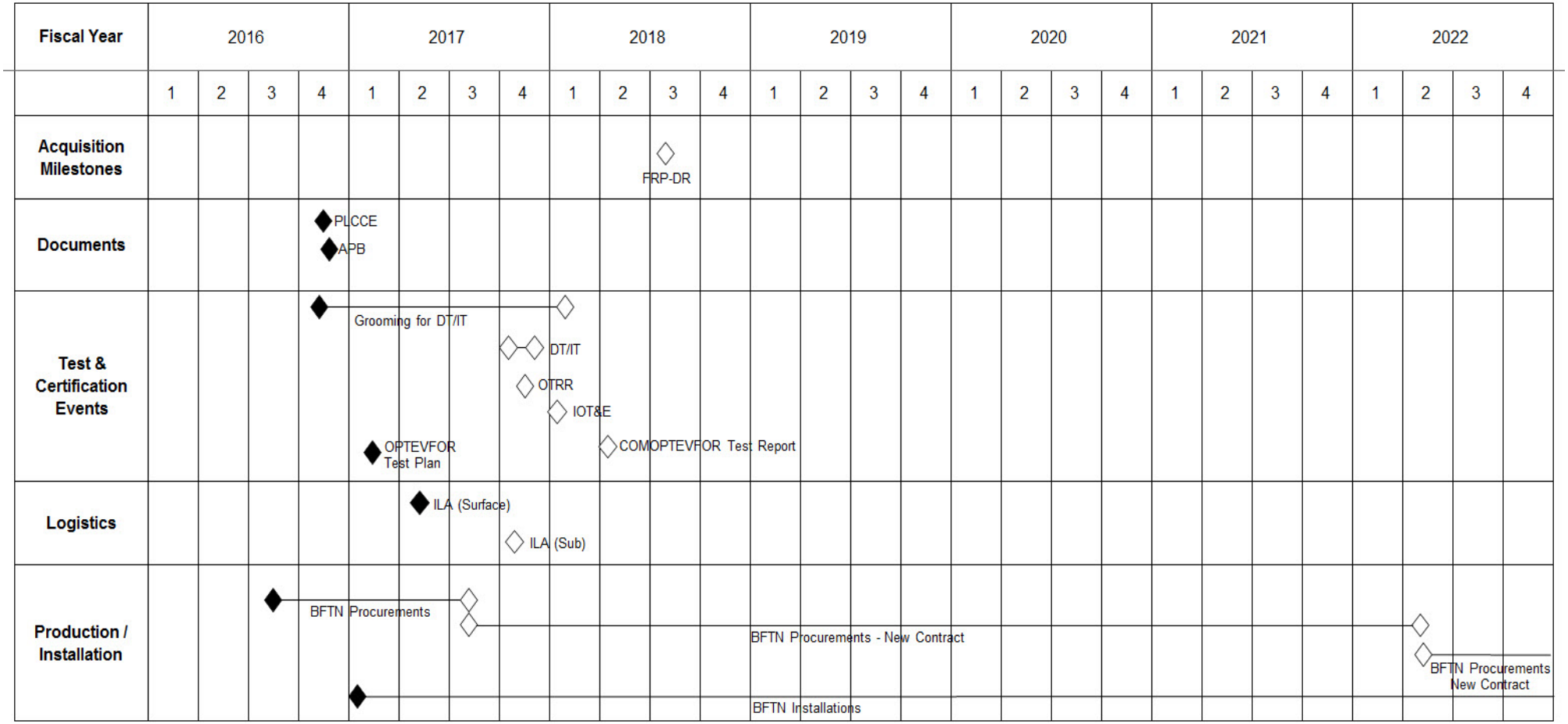
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support JALN-M | C/CPFF | BAH : San Diego, CA | 0.400 | 0.220 | Nov 2015 | 0.367 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.987 | - |
| Systems Eng Support - HFORCE | C/CPFF | Systech : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.350 | Nov 2017 | - | | 0.350 | 0.000 | 0.350 | - |
| Financial Management Support - HFORCE | C/CPFF | Artemis : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.200 | Nov 2017 | - | | 0.200 | 0.000 | 0.200 | - |
| | | **Subtotal** | 1.530 | 1.012 | | 1.267 | | 1.400 | | - | | 1.400 | 0.000 | 5.209 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 161.026 | 39.548 | | 48.225 | | 33.525 | | - | | 33.525 | - | - | - |

**Remarks**

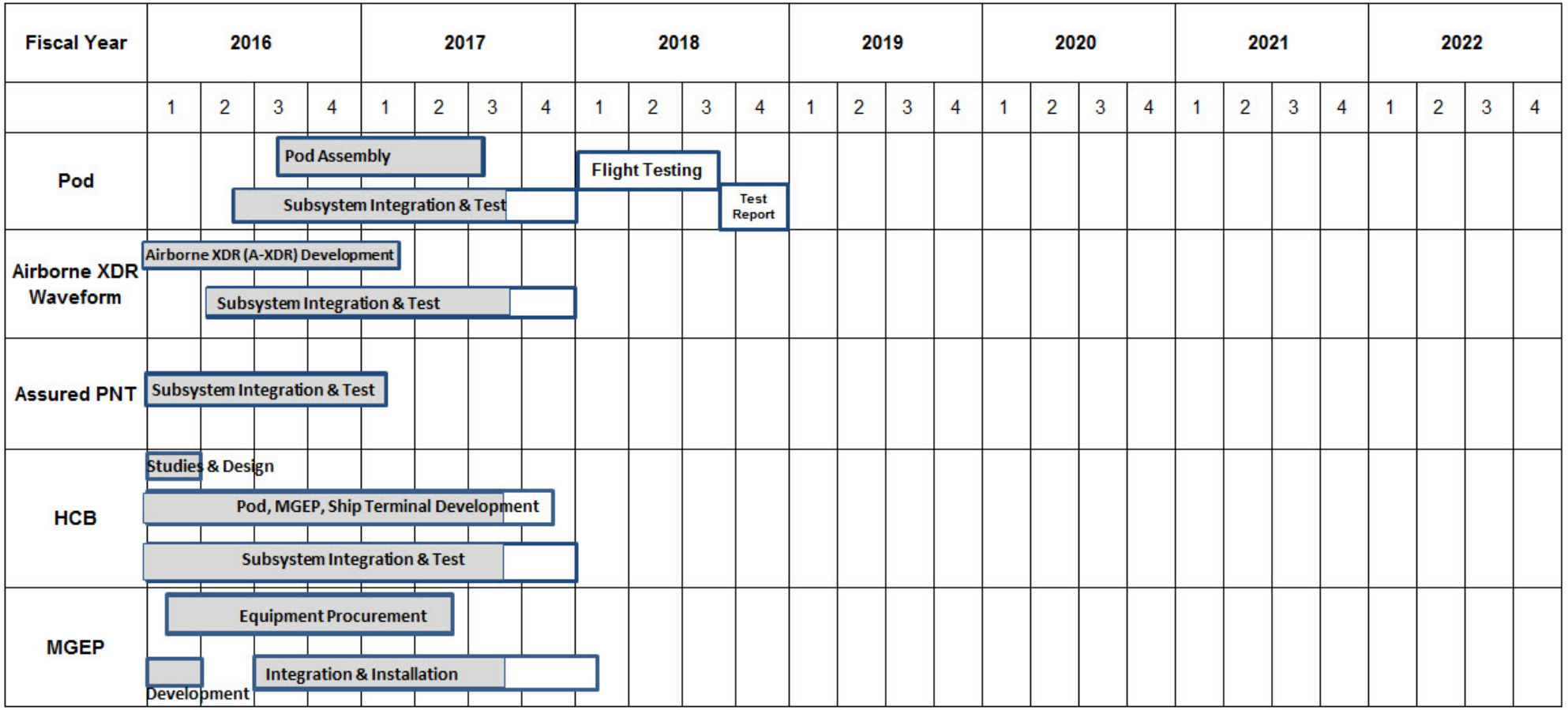
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

## BFTN



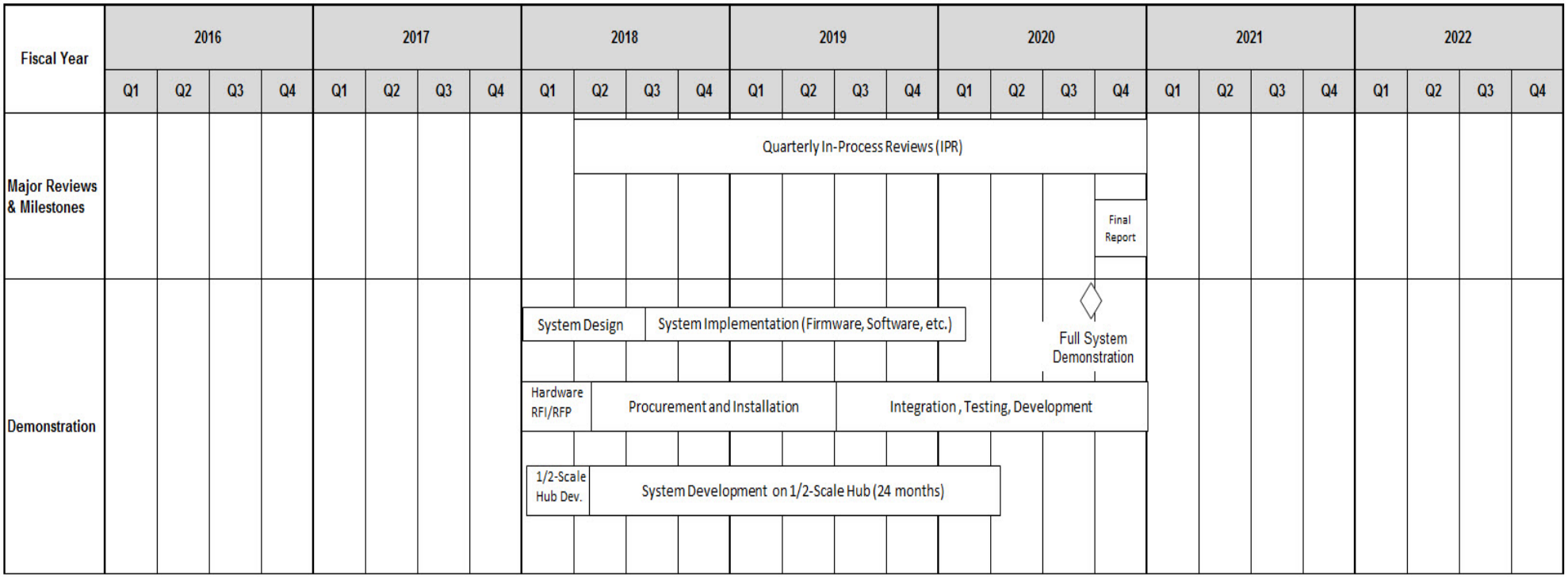
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

## JALN-M Demonstration

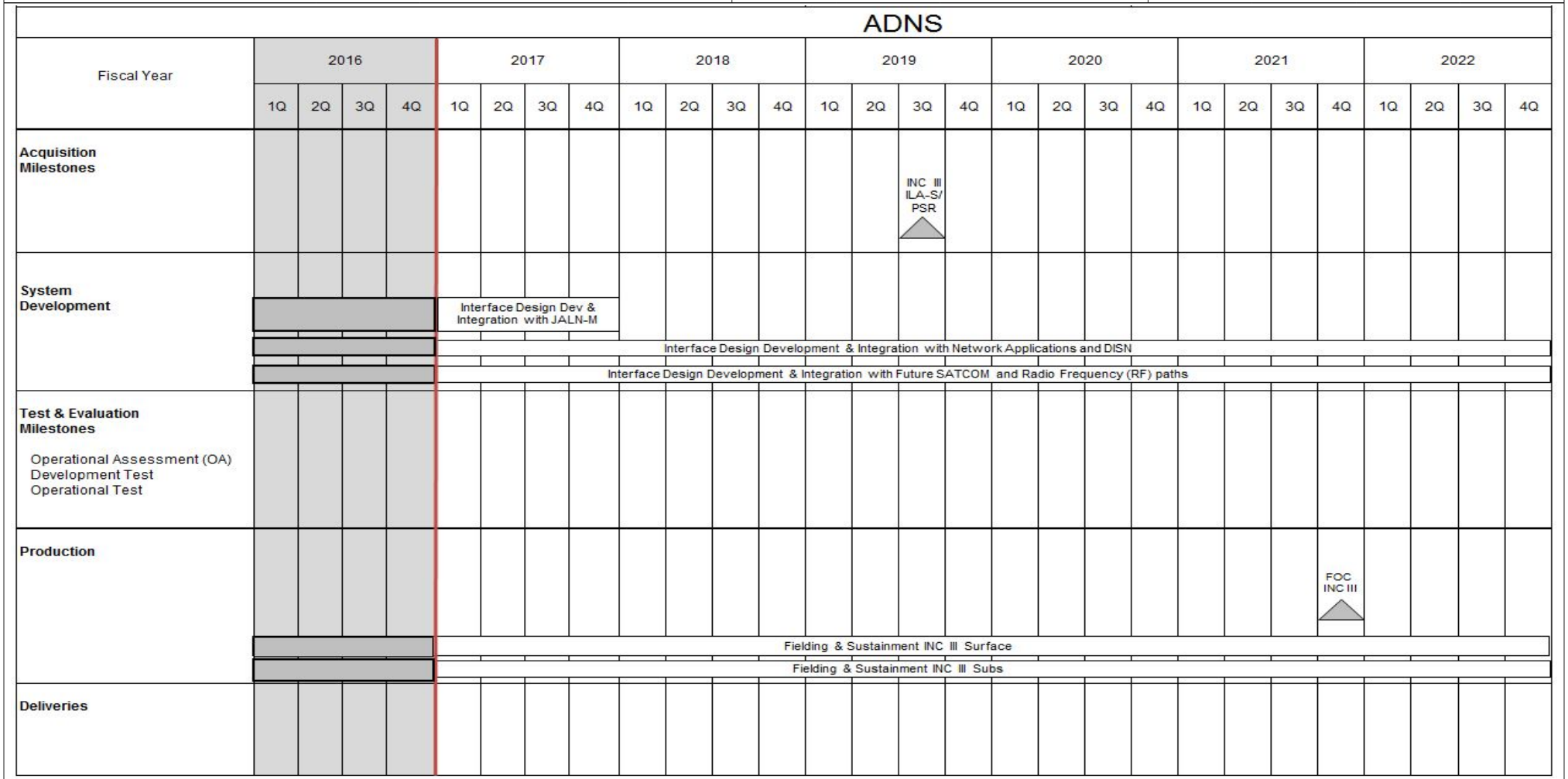


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

## HFORCE Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***BFTN*** | | | | |
| Full Rate Production Decision Review (FRP DR) Baseline System | 3 | 2018 | 3 | 2018 |
| Grooming for Developmental Test/Integrated Test | 4 | 2016 | 1 | 2018 |
| Developmental Test/Integrated Test | 4 | 2017 | 4 | 2017 |
| Operational Test Readiness Review | 4 | 2017 | 4 | 2017 |
| Initial Operational Test & Evaluation | 1 | 2018 | 1 | 2018 |
| COMOPTEVFOR Test Report | 2 | 2018 | 2 | 2018 |
| ***JALN-M*** | | | | |
| Pod Subsystem Integration & Test | 2 | 2016 | 4 | 2017 |
| Pod Assembly | 3 | 2016 | 3 | 2017 |
| Pod Flight Testing | 1 | 2018 | 3 | 2018 |
| A-XDR Development | 1 | 2016 | 1 | 2017 |
| A-XDR Integration & Test | 2 | 2016 | 4 | 2017 |
| PNT Subsystem Integration & Test | 1 | 2016 | 1 | 2017 |
| HCB Studies & Design | 1 | 2016 | 1 | 2016 |
| HCB Pod, MGEP, Ship Terminal Development | 1 | 2016 | 4 | 2017 |
| HCB Integration & Test | 1 | 2016 | 4 | 2017 |
| MGEP Development | 1 | 2016 | 1 | 2016 |
| MGEP Equipment Procurement | 1 | 2016 | 2 | 2017 |
| MGEP Integration & Installation | 3 | 2016 | 1 | 2018 |
| ***HFORCE*** | | | | |
| Quarterly In-Porcess Reviews | 2 | 2018 | 4 | 2020 |
| System Design and Implementation | 1 | 2018 | 1 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204163N / *Fleet Tactical Development* | **Project (Number/Name)**<br>0725 / *Communication Automation* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Hardware RFI/RFP | 1 | 2018 | 2 | 2018 |
| System Integration and Test | 3 | 2019 | 4 | 2020 |
| System Development | 1 | 2018 | 2 | 2020 |
| Full System Demonstration | 3 | 2020 | 3 | 2020 |
| Final Reports | 4 | 2020 | 4 | 2020 |
| ***ADNS*** | | | | |
| System Development: ADNS: Increment III_Interface Design Development and Integration with JALN-M | 1 | 2016 | 4 | 2017 |
| System Development: ADNS: Increment III_Interface Design Development and Integration with Network Applications and Defense Information Systems Network (DISN) | 1 | 2016 | 4 | 2022 |
| System Development: ADNS: Increment III_Interface Design Development and Integration with SATCOM and Radio Frequency (RF) paths | 1 | 2016 | 4 | 2022 |
| Production: ADNS: Increment III_Fielding and Sustainment INC III Surface | 1 | 2016 | 4 | 2022 |
| Production: ADNS: Increment III_Fielding and Sustainment INC III Submarines | 1 | 2016 | 4 | 2022 |
| Production: ADNS: Increment III_Full Operational Capability | 4 | 2021 | 4 | 2021 |
| Acquisition Milestones: ADNS: Increment III Product Support Review | 3 | 2019 | 3 | 2019 |
| Production: ADNS: Increment III_Follow-On Contract | 3 | 2017 | 3 | 2017 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204228N / *Surface Support* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 11.611 | 28.210 | 21.156 | 24.829 | - | 24.829 | 19.071 | 19.453 | 20.388 | 14.347 | Continuing | Continuing |
| 3311: *Navigation Systems* | 11.611 | 28.210 | 21.156 | 24.829 | - | 24.829 | 19.071 | 19.453 | 20.388 | 14.347 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Surface support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) AN/WSN-12 for all Navy platforms. Efforts will include analysis and planning for the alignment and evolution of Afloat Navigation Systems for surface and submarine platforms. Development of Capability Phasing Planning (CPP) processes to drive engineering analysis. The program will implement systems engineering processes to investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing. The INS provides mission critical ship's position and attitude data to shipboard sensors (such as radars), combat systems, gun, and missile systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in absence of GPS. The INS WSN-12 consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM). The ISM being is designed, developed, and procured through competitive contract award to Northrop Grumman in November 2015. The NPM is a Government design. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU) and Low Rate Initial Production (LRIP). The system will go through Critical Design Review (CDR), Test Readiness Review (TRR), and Production Readiness Reviews (PRR). The system will go through extensive testing including Independent Validation and Verification (IV&V), Developmental Testing (DT) and Operational Testing (OT).

Cybersecurity funding will be used for the research, development, documentation and integration testing for cybersecurity hardening and enclave development for navigation systems. Efforts will include the development of boundary defense capabilities, platform specific architectures, Navy-Electronic Chart Display and Information System (Navy-ECDIS) secure solution for existing unclassified configurations and CYBERSAFE implementation. Conduct of cybersecurity risk and vulnerability assessments including development of system models, threat models, and mission models for representative groupings of Navigation systems and cyber security capabilities.

The MK27 gyrocompass provides a backup heading reference for SSBNs and LSD platforms and has become obsolete. The AN/WSN-11 (MK27-Replacement) is a form fit function replacement that provides the same functionality while addressing the obsolescence issues of the original MK27. RDT&E funding supports the development, testing and certification of the AN/WSN-11.

Military GPS User Equipment (MGUE) to provide assured Positioning, Navigation and Timing (PNT) in a GPS degraded environment funding will be used for MGUE integration into SSNs, Tomahawk, and Advanced Anti-Radiation Guided Missile (AARGM). Development of interface and performance requirements and shipboard system architectures to support MGUE integration.

Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the Submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204228N *I Surface Support* |

Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS Uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and Allied missions. This funding will be used to conduct a system level Analysis of Alternatives (AoA) and develop a Technical Requirements Document (TRD). These documents will support detailed analysis of the program implementation strategy to replace obsolete TFDS systems in the Fleet including appropriate documentation and contracting strategies.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 36.045 | 21.156 | 13.529 | - | 13.529 |
| Current President's Budget | 28.210 | 21.156 | 24.829 | - | 24.829 |
| Total Adjustments | -7.835 | 0.000 | 11.300 | - | 11.300 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -7.050 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.785 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 11.250 | - | 11.250 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.050 | - | 0.050 |

**Change Summary Explanation**

The Department reduced FY 2016 funding to finance higher priority Navy needs.

The Department added additional FY 2018 funding for additional Military GPS equipment and to properly price efforts based on planned expenditures.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0204228N / *Surface Support* | | | | Project (Number/Name)<br>3311 / *Navigation Systems* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 3311: *Navigation Systems* | 11.611 | 28.210 | 21.156 | 24.829 | - | 24.829 | 19.071 | 19.453 | 20.388 | 14.347 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Surface support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) AN/WSN-12 for all Navy platforms. Efforts will include analysis and planning for the alignment and evolution of Afloat Navigation Systems for surface and submarine platforms. Development of Capability Phasing Planning (CPP) processes to drive engineering analysis. The program will implement systems engineering processes to investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing. The INS provides mission critical ship's position and attitude data to shipboard sensors (such as radars), combat systems, gun, and missile systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in absence of GPS. The INS WSN-12 consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM). The ISM being is designed, developed, and procured through competitive contract award to Northrop Grumman in November 2015. The NPM is a Government design. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU) and Low Rate Initial Production (LRIP). The system will go through Critical Design Review (CDR), Test Readiness Review (TRR), and Production Readiness Reviews (PRR). The system will go through extensive testing including Independent Validation and Verification (IV&V), Developmental Testing (DT) and Operational Testing (OT).

Cybersecurity funding will be used for the research, development, documentation and integration testing for cybersecurity hardening and enclave development for navigation systems. Efforts will include the development of boundary defense capabilities, platform specific architectures, Navy-Electronic Chart Display and Information System (Navy-ECDIS) secure solution for existing unclassified configurations and CYBERSAFE implementation. Conduct of cybersecurity risk and vulnerability assessments including development of system models, threat models, and mission models for representative groupings of Navigation systems and cyber security capabilities.

The MK27 gyrocompass provides a backup heading reference for SSBNs and LSD platforms and has become obsolete. The AN/WSN-11 (MK27-Replacement) is a form fit function replacement that provides the same functionality while addressing the obsolescence issues of the original MK27. RDT&E funding supports the development, testing and certification of the AN/WSN-11.

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Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the Submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for

proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS Uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and Allied missions. This funding will be used to conduct a system level Analysis of Alternatives (AoA) and develop a Technical Requirements Document (TRD). These documents will support detailed analysis of the program implementation strategy to replace obsolete TFDS systems in the Fleet including appropriate documentation and contracting strategies.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** WSN-12 Inertial Navigation System - Replacement (INS-R) | 20.724 | 15.180 | 11.803 | 0.000 | 11.803 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed Inertial Sensor Model (ISM) Preliminary Design Review (PDR).<br>Continued Navigation Processor Model (NPM) Engineering Development Model (EDM) design.<br>Built 2 NPMs and delivered 1 for integration testing. Began build activities on 6 ISM EDM units.<br>Conducted system level software integration testing.<br>Began conduct of long range inertial testing on the ISM unit.<br>Baselined the system test and evaluation strategy. Conducted the Integrated Baseline Review (IBR) | | | | | |
| ***FY 2017 Plans:***<br>Complete development of the ISM EDMs.<br>Begin ISM EDM and NPM EDM hardware (HW) and software (SW) integration.<br>Complete the system test plans to support Environmental Qualification Testing (EQT).<br>Continue vendor testing on the ISM EDM.<br>Hold system level PDR.<br>Begin ISM Critical Design Review (CDR) and Pre Production Unit (PPU) production effort. Prepare for Environmental Qualification Testing (EQT) on the NPM EDM.<br>Complete program documentation. | | | | | |
| ***FY 2018 Base Plans:***<br>Conduct ISM CDR.<br>Conduct system level CDR.<br>Award the Production Readiness Review (PRR) CLIN for ISM development of LRIP units.<br>Build ISM and NPM PPU's.<br>Build WSN-12 lab.<br>Conclude ISM / NPM EDM integration testing.<br>Begin PPU ISM/NPM EDM testing. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Conduct Environmental Qualification Testing (EQT).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Cybersecurity | 4.377 | 1.918 | 4.804 | 0.000 | 4.804 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Began development of notional, boundary defense capabilities.<br>Initiated development of navigation Cybersecurity requirements based on mandated requirements, threats and standards.<br>Developed platform specific Cybersecurity architecture for protections of navigation equipment.<br>***FY 2017 Plans:***<br>Complete Cybersecurity requirements definition and finalize boundary defense architecture for the Navigation Suite/Enclave.<br>Design a Navy ECDIS Cybersecurity solution for upgrading fielded unclassified configurations to support Secret level operations.<br>Develop disconnect and operational procedures to support implemented threat based cyber conditions.<br>***FY 2018 Base Plans:***<br>Demonstrate Navigation Suite/Enclave boundary defense and centrally managed capabilities.<br>Demonstrate Navigation Suite/Enclave cybersecurity operational procedures.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** WSN-11 MK27 Gyrocompass Replacement | 0.083 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed design, development, and testing of WSN-11 Gyrocompass for surface, amphibious and submarine platforms.<br>Built three prototypes (one of each variant).<br>***FY 2017 Plans:***<br>Transition to OPN under budget line item 0204228N<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Time Frequency Distribution System (TFDS) Replacement | 0.820 | 0.800 | 2.000 | 0.000 | 2.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Developed design documentation to adapt surface design to a submarine configuration and began development of<br>prototype.<br>Began Analysis of Alternatives (AoA).<br>Procured 2 TFDS systems for lab testing.<br>***FY 2017 Plans:***<br>Continue AoA<br>Begin the Technical Requirements Document (TRD).<br>***FY 2018 Base Plans:***<br>Complete AoA<br>Draft Request for Information (RFI)<br>Develop acquisition approach including ACAT strategy, if applicable<br>Finalize the Technical Requirements Document (TRD)<br>Draft System Acquisition Management Plan (SAMP)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Military GPS User Equipment | 0.000 | 0.000 | 3.906 | 0.000 | 3.906 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Development of a Technical Requirements Document (TRD) and trade studies for MGUE integration. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Development of a program acquisition strategy and accompanying documentation.<br>Upgrade of the submarine integration lab and upgrade of the Electronic Control Display Unit (ECDU) to support MGUE card integration<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Submarine Speed Sensors | 1.138 | 0.491 | 0.800 | 0.000 | 0.800 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Developed test plans, procedures, and test fixtures for Environment Qualification Testing (EQT) testing.<br>Conducted EQT testing on Doppler sensor and High Speed Probe Sensor.<br>***FY 2017 Plans:***<br>Develop prototype sensors based on results from EQT testing.<br>***FY 2018 Base Plans:***<br>Complete prototype development and conduct flow tank testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Navigation Support | 1.068 | 2.767 | 1.516 | 0.000 | 1.516 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Provided engineering, logistics, and programmatic support to WSN-11, WSN-12, TFDS, Cyber security and Submarine Speed Sensor efforts.<br>***FY 2017 Plans:***<br>Provide engineering, logistics, and programmatic support for, WSN-12, TFDS, Cyber security and Submarine Speed Sensor<br>Support S&T transitions to LRIP 1 fleet.<br>***FY 2018 Base Plans:***<br>Provide engineering, logistics, and programmatic support for, WSN-12, TFDS, and Cyber security.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 28.210 | 21.156 | 24.829 | 0.000 | 24.829 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/0670: *Other Navigation* | 63.481 | 63.942 | 65.943 | - | 65.943 | 107.588 | 122.148 | 124.705 | 57.665 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Inertial Navigation System (INS) contract competitively awarded in FY 2016.

**E. Performance Metrics**

FY16
Completed ISM Preliminary Design Review (PDR).
Built 2 WSN-12 NPMs and delivered 1 for integration testing.
Began build activities on 6 WSN-12 ISM EDM units.
Initiated Development of navigation Cybersecurity requirements based on mandated requirements, threats and standards.
Completed design, development, and testing of WSN-11 (MK27 gyrocompass replacement).
Began TFDS Analysis of Alternatives (AoA ).

FY17
Complete development of the WSN -12 ISM EDMs.
Conduct WSN-12 Preliminary Design Review (PDR).
Begin WSN-12 ISM Critical Design Review (CDR) and Pre Production Unit (PPU) production effort.
Complete cybersecurity requirements definition for navigation enclave.
Continue TFDS AoA.
Start Submarine Speed Sensor environmental qualification testing.

FY18
WSN-12 Critical Design Review (CDR).
Build WSN-12 ISM PPU's.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

Conduct WSN-12 PRR.
Execute TFDS Program of Record activities.
Complete Submarine Speed Sensor temporary alteration efforts.
Completion of GPS MGUE TRD
Completion of GPS MGUE Systems Engineering Plan
Completion of GPS MGUE Trade Studies
Completion of GPS MGUE System Acquisition Management Plan

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204228N / *Surface Support* | Project (Number/Name)<br>3311 / *Navigation Systems* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering/ Design | WR | SPAWAR Atlantic : Little Creek, VA | 3.451 | 2.119 | Nov 2015 | 0.480 | Feb 2017 | 3.977 | Jan 2018 | - | | 3.977 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | SPAWAR Pacific : San Diego, CA | 0.000 | 0.440 | Mar 2016 | 0.220 | Feb 2017 | 0.720 | Jan 2018 | - | | 0.720 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | WR Systems : Norfolk, VA | 3.213 | 4.524 | Aug 2016 | 1.749 | Sep 2017 | 3.539 | Jan 2018 | - | | 3.539 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | Penn State/ARL : Warminster, PA | 2.020 | 0.530 | Sep 2016 | 0.925 | Jun 2017 | 0.600 | Jan 2018 | - | | 0.600 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NSWC Dahlgren : Dahlgren, VA | 0.383 | 0.260 | Aug 2016 | 0.000 | | 0.339 | Dec 2017 | - | | 0.339 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NSWC Dam Neck : Dam Neck, VA | 0.000 | 0.340 | Mar 2016 | 0.000 | | 2.000 | Dec 2017 | - | | 2.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NSWC PHD : Port Hueneme, CA | 0.000 | 0.000 | | 0.122 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NUWC Newport : Newport, RI | 0.000 | 0.180 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | Old Dominion University : Suffolk, VA | 0.450 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | Northrop Grumman : Charlottesville, VA | 0.000 | 15.338 | Dec 2016 | 12.755 | Sep 2017 | 9.359 | Dec 2017 | - | | 9.359 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | SPAWAR Atlantic : Charleston, SC | 1.200 | 0.330 | Sep 2016 | 0.000 | | 0.196 | Dec 2017 | - | | 0.196 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NSWC Philadelphia : Philadelphia, PA | 0.000 | 0.110 | Mar 2016 | 0.440 | Jun 2017 | 0.660 | Dec 2017 | - | | 0.660 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | Electric Boat : Groton, CA | 0.000 | 0.953 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | John Hopkins, APL : Laurel, MD | 0.000 | 0.000 | | 1.638 | May 2017 | 1.816 | Dec 2017 | - | | 1.816 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | C/CPFF | Draper : Cambridge, MA | 0.000 | 1.475 | Aug 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering/ Design | WR | NSWC Crane : Crane, IN | 0.000 | 0.000 | | 0.060 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.060 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204228N / *Surface Support* | Project (Number/Name)<br>3311 / *Navigation Systems* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 10.717 | 26.599 | | 18.389 | | 23.206 | | - | | 23.206 | - | - | - |

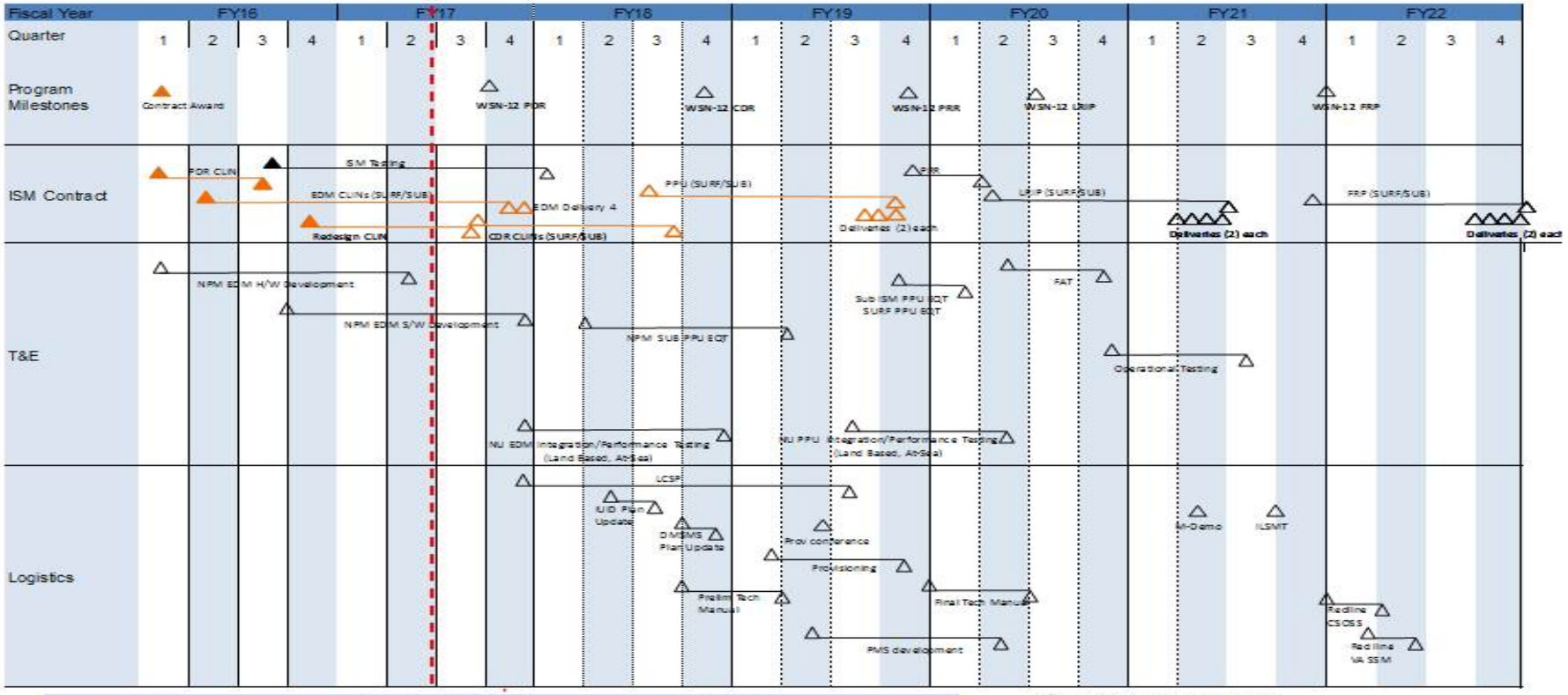
**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | C/CPFF | Various : Not Specified | 0.894 | 1.611 | Mar 2016 | 2.767 | Sep 2017 | 1.623 | Jan 2018 | - | | 1.623 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.894 | 1.611 | | 2.767 | | 1.623 | | - | | 1.623 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 11.611 | 28.210 | | 21.156 | | 24.829 | | - | | 24.829 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |




**Acronym List:**

- *AoA: Analysis of Alternatives
- *APB: Acquisition Program Baseline
- *ASAT: At-Sea Alignment Test
- *CDR: Critical Design Review
- *COATS: Command & Control System Module Off-Hull Assembly & Test Site
- *CPD: Capability Production Doc
- *CSEDS: Combat Systems Engineering Development Site
- *CVN: Aircraft Carrier Nuclear
- *DT: Developmental Testing
- *EDM: Engineering Development Model
- *EQT: Engineering Qualification Test
- *FOT&E: Follow On Test & Evaluation
- *IBR: Integrated Baseline Review
- *IOT&E: Initial Operational Test & Evaluation
- *ILA: Independent Logistics Assessment
- *IOC: Initial Operational Capability
- *IPT: Integrated Product Team
- *ISIM: Inertial Sensor Module
- *LRIP: Low Rate Initial Production
- *LOO: Letter of Observation
- *M-Code: Military Code
- *OT: Operational Testing
- *OTRR: Operational Test Readiness Review
- *NPM: Navigation Processor Module
- *NU: Navigation Unit
- *PDR: Preliminary Design Review
- *PPU: Pre Production Unit
- *PRR: Production Readiness Review
- *RFP: Request For Proposal
- *SAMP: Single Acquisition Management Plan
- *SCSC: Surface Combat Systems Center
- *SOW: Statement of Work
- *SSN: Ship, Submersible, Nuclear
- *SVR: Systems Verification Review
- *TDP: Technical Data Package
- *TEMP: Test and Evaluation Master Plan
- *TRR: Test Readiness Review
- *VMS: Voyage Management System

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 3311*** | | | | |
| WSN-12 Contract Award | 1 | 2016 | 1 | 2016 |
| ISM PDR | 3 | 2016 | 3 | 2016 |
| WSN-12 PDR | 4 | 2017 | 4 | 2017 |
| ISM CDR | 1 | 2018 | 1 | 2018 |
| WSN-12 CDR | 4 | 2018 | 4 | 2018 |
| WSN-12 PRR | 4 | 2019 | 4 | 2019 |
| WSN-12 LRIP | 3 | 2020 | 3 | 2020 |
| OTRR | 2 | 2021 | 2 | 2021 |
| WSN-12 FRP | 4 | 2021 | 4 | 2021 |
| BDC Development | 2 | 2016 | 4 | 2017 |
| Secure Navigation Architecture Development | 3 | 2016 | 1 | 2018 |
| BDC Integration Testing | 2 | 2018 | 4 | 2018 |
| Development | 1 | 2016 | 2 | 2016 |
| PPU | 3 | 2016 | 3 | 2016 |
| At Sea Testing | 3 | 2016 | 3 | 2016 |
| Environmental Qualification Testing (EQT) | 4 | 2016 | 4 | 2016 |
| WSN-11 SSBN Installation | 3 | 2017 | 4 | 2022 |
| AoA | 4 | 2016 | 4 | 2017 |
| TFDS Develop TRD | 4 | 2017 | 4 | 2017 |
| Pre-Acquisition Activity | 1 | 2018 | 1 | 2019 |
| TFDS Contract Award | 3 | 2019 | 3 | 2019 |
| Acquisition Plan | 2 | 2018 | 4 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204228N / *Surface Support* | **Project (Number/Name)**<br>3311 / *Navigation Systems* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| GPS Modernization Develop TRD | 1 | 2018 | 3 | 2018 |
| System Eng Plan | 1 | 2018 | 4 | 2018 |
| DHYSL Lab Testing | 1 | 2016 | 1 | 2016 |
| SSBN At Sea Testing | 2 | 2016 | 2 | 2016 |
| SSBN Installation | 3 | 2017 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 3,138.577 | 26.650 | 91.355 | 133.617 | - | 133.617 | 239.203 | 212.974 | 180.642 | 57.761 | Continuing | Continuing |
| 0545: *TOMAHAWK* | 3,138.577 | 26.650 | 91.355 | 133.617 | - | 133.617 | 239.203 | 212.974 | 180.642 | 57.761 | Continuing | Continuing |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 289 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Funds support development of the Tomahawk Weapons System (TWS) encompassing Tactical Tomahawk upgrades including initiation of baseline improvements into the Block IV weapon system, Tactical Tomahawk Weapons Controls System (TTWCS), Theater Mission Planning Center (TMPC) upgrades and other missile system improvements to maintain pace with threats. The TWS provides a long range cruise missile attack capability against fixed and mobile targets. Tomahawk is capable of being deployed from both submarines and surface ships and significantly increases the total capability of joint forces.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under Operational Systems Development because it includes development efforts to upgrade systems that have been fielded or have received approval for Full Rate Production (FRP) and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 25.227 | 71.355 | 63.035 | - | 63.035 |
| Current President's Budget | 26.650 | 91.355 | 133.617 | - | 133.617 |
| Total Adjustments | 1.423 | 20.000 | 70.582 | - | 70.582 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 1.905 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.482 | 0.000 | | | |
| • Program Adjustments | 0.000 | 20.000 | 69.954 | - | 69.954 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.628 | - | 0.628 |

**Change Summary Explanation**

Technical: FY 2018 funding continues Anti-Access/Area Denial (A2AD) navigation improvements and A2AD communication upgrade baseline improvements as well as incorporate a seeker into the Block IV Tomahawk Weapon System as part of the recertification of the Tactical Tomahawk (TACTOM). Increase in funding provided for the commencement of development activities associated with Military-code (M Code) insertion and the Joint Multiple-Effects Warhead System (JMEWS) into the Tomahawk Weapons System.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204229N *I Tomahawk Mssn Planning Ctr* |

Schedule:

Changed naming convention from ETACTOM to Maritime.

Added TMPC Test and Evaluation periods for software versions 5.0.2 and 6.0 to support the 5.0.2 and 6.0 IOC's previously annotated in PB 2017.

Changed naming convention of A2AD IPR1 to A2AD SRR to align directly with Systems Engineering Technical Review Process.

Changed naming convention of A2AD IPR2 to A2AD PDR to align directly with Systems Engineering Technical Review Process and moved from 3Q 2017 to 2Q 2017.

Changed naming convention of A2AD IPR3 to A2AD CDR to align directly with Systems Engineering Technical Review Process and moved it from 3Q 2018 to 1Q 2018.

Deleted A2AD SFR from 3Q 2016 due to revised system engineering technical review strategy.

Extended A2AD (NAV/Comms) ECPs from 1Q FY 2016 - 4Q FY 2019 to 1Q FY 2016 - 4Q FY2020 to account for ongoing ECP's throughout the projected development program.

Changed "Baseline Improvement ECP kit award" to "A2AD (Comms/NAV) kit award".

Updated the Maritime Strike Capability schedule due to plans to employ a Rapid Deployment Capability (RDC), in accordance with the DoD 5000.2, resulting in a IOC in 3Q FY 2022 following a Quick Reaction Assessment. This strategy affords the program flexibility in achieving a minimum capability in a timely manner within the confines of a RDC. As a result the following items have been added or shifted:

Moved Maritime Strike System DT/OT moved from 1Q FY 2020 - 4Q FY 2021 to 3Q FY 2019 - 4Q FY 2021.

Added Maritime Strike Contract Award during 4Q FY 2017 fourth quarter award due to new start budgetary authority.

Moved Maritime Strike TTWCS Development from 1Q FY 2017- 4Q FY 2018 to 3Q FY 2017 to 1Q FY 2021 due to new start budgetary authority.

Moved Maritime Strike TMPC Development from 1Q FY 2017 - 4Q FY 2018 to 3Q FY 2017 to 4Q FY 2020 due to new start budgetary authority.

Added Maritime Strike Software Design from 3Q FY 2017 to 3Q FY 2019.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204229N *I Tomahawk Mssn Planning Ctr* |

Added Maritime Strike NAVSIL Update from 3Q FY 2017 to 2Q FY 2018.

Added Maritime Strike Suite Selected during 3Q FY 2018.

Added Maritime Strike Initial Integration Testing during 4Q FY 2018.

In accordance with the Maritime Strike Acquisition Strategy and Acquisition Plan the following six events have been added or have shifted.

Added Maritime Strike IOC 3Q FY 2022.

Added Maritime Strike IOC QRA during 4Q FY 2021.

Added Maritime Strike Final Integration Testing during 4Q FY 2019.

Moved Maritime Strike Testing from 1Q FY 2020 - 4Q FY 2021 to 3Q FY 2019 to 4Q FY 2021.

Added Maritime Strike Production Contract Award 2Q FY 2021.

Added Maritime Production 2Q FY 2022 - 4Q FY 2022.

Added M-Code development effort required for next-generation GPS security architecture.

Added the JMEWS risk reduction and development items required for new the warhead capability program.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | | | | Project (Number/Name)<br>0545 / *TOMAHAWK* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 0545: *TOMAHAWK* | 3,138.577 | 26.650 | 91.355 | 133.617 | - | 133.617 | 239.203 | 212.974 | 180.642 | 57.761 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 289

**A. Mission Description and Budget Item Justification**

The Tomahawk Weapons System (TWS), formally referred to as Tomahawk Land Attack Missile (TLAM), provides a long range cruise missile attack capability against fixed and mobile targets. This program ensures that the TWS exploits state of the art technology to preserve the efficiency of this proven weapon system, and includes all missile development, mission planning, weapons control system development, and submarine integration development.

The Tactical Tomahawk All-Up-Round (AUR) Block IV missile is a comprehensive baseline upgrade to the TWS that provides the tactical commander a quick reaction response capability as well as improved flexibility, increased accuracy and higher lethality. A five-year multi-year (FY 2004 - FY 2008) production contract was awarded in August 2004 for the production of up to 2,200 Block IV Tomahawk missiles. The essential upgrades of the Block IV missile are: improved guidance, navigation, control and mission computer two-way satellite communications (SATCOM), and a lower production cost as compared to the Block III missile. Block IV provides a Ultra High Frequency SATCOM data link to enable the missile to receive in-flight mission modification messages, to transfer health and status messages and to broadcast Battle Damage Indication messages. Block IV also includes a high anti-jam Global Positioning System (GPS) receiver, navigation improvements, and associated antenna systems. The Tomahawk program also includes development of continuing advances identified under the Tomahawk Baseline IV Operational Requirements Document (ORD), to include development of advanced warheads.

Tactical Tomahawk baseline improvements include the following: 1) Anti-Access / Area Denial (A2AD) upgrades to navigation and communication of the weapon system. These updates will allow for planned missions using Terrain Contour Matching (TERCOM)/ Digital Scene Matching Area Correlation (DSMAC)/ Vertical Update (VUP) without GPS and continued communication of the Tactical Tomahawk AUR to provide Health and Status and to allow missile redirection in-flight respectively. 2) Maritime Strike Tomahawk modernization effort provides the capability to hit moving maritime targets through mid-course guidance via a third party or seeker mode, to a terminal seeker area of uncertainty 3) M-Code upgrades the Tactical Tomahawk to the next generation GPS satellite constellation required to maintain GPS-provided position, navigation, and timing (PNT) for the missiles and is estimated to be in full operation by FY 2022. The M-code mandate and Public Law restrict the purchase of only M-code-capable GPS User Equipment (MGUE) after FY 2017 unless a waiver is granted by the Secretary of Defense. 4) The design and integration of the Joint Multiple-Effects Warhead System (JMEWS) enables the weapon to utilize multiple lethal effects to address Hard and Deeply Buried Targets (HDBT) while increasing the TWS capabilities against Integrated Air Defense Systems (IADS) and Weapons of Mass Destruction (WMD).

The Theater Mission Planning Center (TMPC) consists of Commercial and Government Off-The-Shelf (COTS/GOTS) software and COTS hardware. TMPC provides targeting, mission planning, strike planning and execution, mission distribution, and operational employment capabilities for the Tomahawk Weapons System. Continuous TMPC software development decreases mission planning time and increases the quality and accuracy of each mission while reducing complexity. TMPC provides mission planning at the theater and operational levels and is designed for high rate mission planning production responsive to national strategic, operational,

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

and tactical requirements. TMPC develops and distributes missions for all variants of the Tomahawk Missile; provides command information services for TWS; provides strike planning, execution, coordination, control and reporting, and provides Maritime Component Commanders (MCC) the capability to plan or modify conventional Tomahawk BLK III missions. TMPC has evolved into scalable configurations deployed in four configurations at 186 sites: Cruise Missile Support Activities (CMSAs) (3+1 FMS), Tomahawk Strike Mission Planning Cells (TSMPCs) (3 - C5F, C6F, C7F), Carrier Strike Groups (CSGs) (19 - 10 CVN), Firing Units (FRUs) (84 Surface/57 Submarines), Fleet Training Sites and Labs (19). TMPC is employed in major combat operations and Overseas Contingency Operations. TMPC was previously referred to as "Tomahawk Command and Control System (TC2S)".

The Tactical Tomahawk Weapons Control System (TTWCS) provides launch capability for surface and submarine platforms. Development of the TTWCS provides a common architecture to launch the TACTOM and all variants in inventory. Development of upgrades to the TTWCS is required to meet the Department of Defense Information Technology Standards Registry, to meet FORCEnet compliance and be Internet Protocol Version 6 ready in order to remain interoperable within the Joint Service Architecture and to retain weapons system viability and usability for our Sailors. Additionally, TTWCS provides launch capability for both types of modernization efforts, A2AD (Nav/Comms) and Maritime, through an incremental approach to software and hardware upgrades. These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime capability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Tactical Tomahawk All-Up-Round (AUR) and Tactical Tomahawk Weapons Control System (TTWCS) | 23.328 | 80.328 | 114.806 | 0.000 | 114.806 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Continue Anti-Access/Area Denial (A2AD) navigation and communication integration into Block IV weapons system. Continue fleet experimentation and requirements coordination as well as Concept of Operations (CONOPS)/ Concept of Employment development. Continuation of the design and integration of the seeker suite into the Tactical Tomahawk (TACTOM) to be incorporated during recertification. Continuation of the cooperatively funded United States Navy/United Kingdom Joint Multi-Effects Warhead System (JMEWS) / Joint Capability Technology Demonstration (JCTD) and the commencement of fuze technology maturation and risk-reduction. Include significant research and analysis of the worldwide target set capability gaps to include Hard and Deeply Buried Targets and conventional Global Strike targets. In addition, NAWCAD also provides engine power data/analysis in order to determine reserve power available to power potential upgrades to the Tomahawk AUR, such as JMEWS. Commence development of activities associated with Military Global Positioning System User Equipment (MGUE) Insertion. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continuation of A2AD navigation and communications transition and engineering change proposals to include software development, hardware development, systems engineering, integration, system testing and transition documentation. Hardware development will include development and testing of either multiple or multi-band antennas, and continued development and testing of an integrated single box solution radio. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Software development will include continued development and testing of Operationally Embedded Software for incorporation into the missile, as well as development of TTWCS for qualification testing. Update Tomahawk test and evaluation master plan. Continue JMEWS transition, integration, demonstration, and test efforts. Perform target and lethality assessments, engine performance analysis to include high-speed engine feasibility studies and SBIRs, data-fusion studies, campaign planning and mission analysis for potential TACTOM upgrades or new applicable weapons. Continue participation in fleet experimentation and kill chain analysis. Perform Non-Recurring Engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD as directed. Conduct activities ISO Speed to Fleet (S2F) Initiative for Synthetic Guidance IAW program plan. Effort includes Fleet coordination, development of Tactics, Techniques, and Procedures (TTPs), development of Concept of Operations/Concept of Employment (CONOPS/CONEMP), test support and conduct, and development and delivery of networking and targeting software to provide a potential limited operational capability to the Fleet. | | | | | |
| ***FY 2017 Plans:***<br>Continuation of A2AD navigation and communications transition and engineering change proposals to include software and hardware final development, testing and deliveries of test equipment to supporting weapons control system laboratories; systems engineering reviews; integration, system testing and transition documentation. Hardware development will include development and testing of either multiple or multi-band antennas, testing of an integrated single box solution radio, and initial testing at missile segment level, integration and check out of test and support equipment at supporting labs, and identification/preliminary coordination of the test ship for TTWCS integration and testing. Software development will include continued development and testing of Operationally Embedded Software for incorporation into the missile, as well as development of TTWCS for qualification testing. Update Tomahawk test and evaluation master plan.<br><br>Commence activities in support of Maritime Strike Tomahawk (MST). Effort includes development of system requirements, specifications, and interfaces; integration of seeker suites; TTWCS, TMPC, and missile software development; and lab and component-level testing. Additionally, coordinate with Fleet stakeholders to develop TTPs and CONEMPs/CONOPs, coordinate with Integrated Warfare Capability teams to develop and assess kill-chains.<br><br>Continue JMEWS transition, integration, demonstration, and test efforts. Perform target and lethality assessments, engine performance analysis to include high-speed engine feasibility studies and SBIRs, data-fusion studies, campaign planning and mission analysis. Continue participation in fleet experimentation and kill | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| chain analysis. Perform Non-Recurring Engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD as directed.<br><br>Conduct activities in support of Speed to Fleet (S2F) Initiative for Synthetic Guidance in accordance with the program plan. Effort includes Fleet coordination, development of Tactics, Techniques, and Procedures (TTPs), development of Concept of Operations/Concept of Employment (CONOPS/CONEMP), test support and conduct, and development and delivery of networking and targeting software to provide a potential limited operational capability to the Fleet.<br>***FY 2018 Base Plans:***<br>FY 2018 plans include A2AD navigation and communications transition and engineering change proposals for software and hardware development and testing to include system engineering reviews, integration, system testing and transition documentation. Includes the execution of end-to-end Tactical Tomahawk system integration testing with pre-production hardware and software to support navigation and communication upgrades required for production decision point for procurement. Finalize TTWCS v5.6 software build and enter Computer Software Configuration Item (CSCI) build Formal Qualification Testing (FQT). Develop segment test procedures and enter formal segment level testing continuing the software coding of the corrective build after the test discovery phase. Conduct TTWCS test ship certification phase and "fix it" build software development.<br><br>Continue activities in support of Maritime Strike Tomahawk integration. Effort includes refinement of system requirements, specifications, and interfaces; integration engineering, laboratory simulation development, qualification of hardware and software, and captive carry flights of seeker suites by the prime; TTWCS, TMPC, and missile OES software development; lab and component-level testing. Specifically, the following items are planned for FY 2018: seeker software functionality in the Navigation & Guidance System Integration Laboratory (NAVSIL), telemetry system verified in NAVSIL, results from early integration of WCS, TMPC and OES, early integration build of TMPC for ground launch use, ground launch system checkout completed, data from captive flight test on Block IV Tomahawk, simulation updates, conduct TWS ground launch, start WCS and TMPC system qualification testing. Coordinate with fleet stakeholders to develop TTPs and CONEMPs/CONOPs.<br><br>Military-code (M Code) planned activities include Application Specific Integrated Circuit (ASIC) integration with the M Code GPS user equipment initial AGR-M testing, design reviews, requirements definition and decomposition, box-level and system-level specification finalization, interface development, and test planning. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue JMEWS transition, integration, demonstration, and test efforts which will include fuze technology maturation and risk-reduction. Perform target and lethality assessments, engine performance analysis to include high-speed engine feasibility studies and SBIRs, data-fusion studies, campaign planning and mission analysis for potential TACTOM upgrades or new applicable weapons. Continue participation in fleet experimentation and kill chain analysis. Perform non-recurring engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD as directed.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Theater Mission Planning Center (TMPC)<br>***Articles:***<br>***Description:*** Development and incorporation of new capabilities into the Theater Mission Planning Center (TMPC) necessary for the employment of the Tomahawk Weapon System (TWS).<br>***FY 2016 Accomplishments:***<br>Continue Tomahawk Weapon System navigation and accuracy and weapons delivery Circular Error Probable (CEP) studies and assessments necessary to ensure the TWS is properly employed; continued evaluation of TMPC design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TMPC. Continue evaluation of imagery formats resulting from NGA mandated architectural changes. Continue development of A2AD software for targeting and navigation improvements.<br>***FY 2017 Plans:***<br>Continue Tomahawk Weapon System navigation and accuracy and weapons delivery CEP studies and assessments necessary to ensure the TWS is properly employed; continued evaluation of TMPC design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TMPC. Continue evaluation of imagery formats resulting from nationally mandated architectural changes. Complete development, coding and initial system integration and testing of timeline improvements and A2AD software for TMPC 6.0. TMPC 6.0 includes A2AD navigation and communications improvements required to support the Tomahawk Weapons System (TWS) Modernization program. Initiate system integration into the TMPC mission planning environment in support of the Maritime Strike capability.<br>***FY 2018 Base Plans:*** | 3.322<br>- | 11.027<br>- | 18.811<br>- | 0.000<br>- | 18.811<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue Tomahawk Weapon System navigation and accuracy and weapons delivery CEP studies and assessments necessary to ensure the TWS is properly employed; continued evaluation of TMPC design process to ensure Tactical Tomahawk missile performance characteristics are adequately modeled in TMPC. Continue evaluation of imagery formats resulting from nationally mandated architectural and format changes. Commence A2AD navigation and communications integration testing. A2AD navigation and communications improvements required to support the Tomahawk Weapons System (TWS) Modernization program. Complete development, coding, and initial system integration of Maritime Strike Tomahawk capability in support of the Maritime Strike requirement. Initiate requirements definition and preliminary design to support TWS MGUE upgrade. The Military-code (M-Code) upgrade is necessary to enhance TWS GPS signal capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 26.650 | 91.355 | 133.617 | 0.000 | 133.617 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN/2101: *Tomahawk* | 202.314 | 271.905 | 134.375 | 91.608 | 225.983 | 99.705 | 100.603 | 119.079 | 144.469 | Continuing | Continuing |
| • OPN/5253: *Tomahawk Support Equipment* | 71.245 | 95.546 | 73.184 | - | 73.184 | 72.852 | 73.015 | 74.539 | 76.023 | Continuing | Continuing |
| • OPN/9020: *Initial and Vendor Direct Spares* | 0.147 | 0.177 | 0.311 | - | 0.311 | 0.374 | 0.281 | 0.231 | 0.204 | Continuing | Continuing |
| • WPN/6120: *Spares and Repair Parts* | 70.347 | 39.815 | 13.518 | - | 13.518 | 26.878 | 29.566 | 18.408 | 18.605 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The TACTOM Weapon System achieved IOC in May 2004. The acquisition strategy involves maintaining production through FY 2017 with final deliveries in FY 2019. With production halting, transition into recertification starting in FY 2019 for half-life missiles. Recertification of TACTOM missiles starting in FY 2019 provides modernization opportunities to improve weapon system performance to include communication and navigation baseline improvements.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

The Maritime Strike Tomahawk will employ a Rapid Deployment Capability (RDC) acquisition plan, in accordance with the DoD 5000.2, resulting in a IOC in FY 2022 following Quick Reaction Assessment (QRA) and characterization. This strategy affords the program flexibility in achieving a minimum capability in a timely manner. Following a fielding of IOC, further procurements will comply with DoD 5000.2 for programs of record.

The M-Code acquisition strategy includes the development, integration, test, qualification and production of a new GPS receiver which will satisfy the M-Code requirement with installations commencing in FY 2022. Initially funded by the United States Air Force commencing in FY 2015, efforts have been underway as part of the Robust Positioning, Navigation and Timing Integrated Technology (RPNT) program and have included the interface and specification development, layout and initial design and testing required to commence integration into the Tomahawk Weapon System commencing in FY 2018.

TMPC and TTWCS require periodic hardware and software updates to maintain compliance with IA standards and maintain system relevance against emerging threats. TMPC and TTWCS segments will rely on a blend of industry and government expertise through the remaining life of the program.

Upon completion of the Joint Multiple Effects Warhead System (JMEWS) fuze reduction activities in FY 2019, the program will conduct integration, SETR, and testing activities which will result in two potential procurement/integration into BLK IV process options. Additionally, corresponding updates to the Tactical Tomahawk Weapons Control System (TTWCS) and the Theatre Mission Planning Center(TMPC) will need to be made to properly launch the missile and plan for JMEWS missions. Operational testing and IOC are scheduled for FY 2023.

**E. Performance Metrics**

The Navy seeks to improve the Tomahawk cruise missile attack capability against land and maritime targets through research and development.

Examples in the area of the All-Up-Round include development of candidate warheads and sensors that will enhance weapon ability to cover all assigned target types, provide a quick reaction response capability for the weapon system, and improved guidance, navigation, control, mission computer two-way satellite communications, and a high anti-jam GPS receiver all in line with state of the art technology.

In the area of the weapons control system, research and development is performed to ensure viability and usability of the system into the future, providing necessary upgrades to meet the Department of Defense Information Technology standards registry to comply with FORCEnet requirements and be Internet Protocol Version 6 ready to remain interoperable within Joint Service Architecture, in order to provide battle-group tactical flexibility and responsiveness needed to enable full wartime capability.

In the area of the TMPC, continue research and development in order to provide scalable configurations to deploy where and as needed to provide necessary command and control, development necessary to function with national and tactical imagery architectures, decrease mission planning time, and increase the quality and accuracy of each mission for the TWS.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | Project (Number/Name)<br>0545 / *TOMAHAWK* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering - A2AD Improvements Prime Integrator (NAV/ COMMS) | SS/CPFF | Raytheon : Tucson, AZ | 2.154 | 10.024 | Feb 2016 | 12.935 | Feb 2017 | 8.133 | Feb 2018 | - | | 8.133 | Continuing | Continuing | Continuing |
| Systems Engineering - TTWCS A2AD Improvements (NAV/ COMMS) | WR | NSWC : Dahlgren, VA | 2.650 | 0.000 | | 0.603 | Feb 2017 | 0.847 | Feb 2018 | - | | 0.847 | Continuing | Continuing | Continuing |
| Systems Engineering - Hardware Development- A2AD Improvements (NAV/COMMS) | MIPR | NRO : Chantilly, VA | 9.493 | 12.076 | Nov 2015 | 9.725 | Nov 2016 | 8.470 | Nov 2017 | - | | 8.470 | Continuing | Continuing | Continuing |
| Systems Engineering- TTWCS Software Support Activity(NAV/COMMS) | SS/CPFF | LMVF : Valley Forge, PA | 0.400 | 0.717 | Apr 2016 | 2.276 | Apr 2017 | 2.817 | Feb 2018 | - | | 2.817 | Continuing | Continuing | Continuing |
| M-Code - TTWCS | WR | NSWC : Dahlgren, VA | 0.000 | 0.000 | | 0.000 | | 0.800 | Nov 2017 | - | | 0.800 | Continuing | Continuing | Continuing |
| M-Code - AUR | C/CPFF | Raytheon : Tucson, AZ | 0.000 | 0.000 | | 0.000 | | 11.849 | Feb 2018 | - | | 11.849 | Continuing | Continuing | Continuing |
| M-Code- AUR | SS/FFP | Raytheon SAS : El Segundo, CA | 0.000 | 0.000 | | 0.000 | | 6.006 | Dec 2017 | - | | 6.006 | 0.000 | 6.006 | 6.006 |
| M-Code | WR | NSWC-IH : Indian Head, MD | 0.000 | 0.000 | | 0.000 | | 0.300 | Nov 2017 | - | | 0.300 | 0.000 | 0.300 | - |
| M-Code | WR | NUWC-RI : Newport, RI | 0.000 | 0.000 | | 0.000 | | 0.200 | Nov 2017 | - | | 0.200 | 0.000 | 0.200 | - |
| M-Code | WR | NAWC-AD : Pax River, MD | 0.000 | 0.000 | | 0.000 | | 0.702 | Nov 2017 | - | | 0.702 | 0.000 | 0.702 | - |
| M-Code - TMPC | SS/CPFF | Tapestry : St. Louis, MO | 0.000 | 0.000 | | 0.000 | | 0.150 | Dec 2017 | - | | 0.150 | 0.000 | 0.150 | 0.150 |
| M-Code - TMPC | SS/CPFF | CommGlobal : SanJose, CA | 0.000 | 0.000 | | 0.000 | | 0.600 | Dec 2017 | - | | 0.600 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | SS/CPFF | CommGlobal : San Jose, CA | 0.000 | 0.000 | | 1.617 | Dec 2016 | 3.430 | Dec 2017 | - | | 3.430 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | Project (Number/Name)<br>0545 / *TOMAHAWK* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maritime Strike - TMPC | SS/CPFF | Tapestry : St. Louis, MO | 0.000 | 0.000 | | 0.622 | Dec 2016 | 1.879 | Dec 2017 | - | | 1.879 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | SS/CPFF | BAE Systems : San Diego, CA | 0.000 | 0.000 | | 1.444 | Dec 2016 | 1.953 | Dec 2017 | - | | 1.953 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | SS/CPFF | Leidos : California, MD | 0.000 | 0.000 | | 2.316 | Dec 2016 | 3.945 | Dec 2017 | - | | 3.945 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | SS/CPFF | URAC APL : Laurel, MD | 0.000 | 0.000 | | 0.052 | Dec 2016 | 0.045 | Dec 2017 | - | | 0.045 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | WR | NAWC-AD : Pax River, MD | 0.000 | 0.000 | | 0.267 | Nov 2016 | 0.275 | Nov 2017 | - | | 0.275 | Continuing | Continuing | Continuing |
| Maritime Strike - TMPC | WR | NSWC-DD : Dahlgren, VA | 0.000 | 0.000 | | 0.172 | Nov 2016 | 0.153 | Nov 2017 | - | | 0.153 | Continuing | Continuing | Continuing |
| Maritime Strike - AUR | C/CPFF | Raytheon : Tucson, AZ | 0.000 | 0.000 | | 38.500 | Jul 2017 | 52.470 | Dec 2017 | - | | 52.470 | Continuing | Continuing | Continuing |
| Maritime Strike | SS/CPFF | UARC APL : Laurel, MD | 0.000 | 0.000 | | 0.500 | Dec 2016 | 0.425 | Dec 2017 | - | | 0.425 | 0.000 | 0.925 | 0.925 |
| Maritime Strike - TTWCS | WR | NSWC-DD : Dahlgren, VA | 0.000 | 0.000 | | 6.510 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Maritime Strike - TTWCS | SS/CPFF | LMVF : Valley Forge, PA | 0.000 | 0.000 | | 0.500 | Dec 2016 | 2.000 | Dec 2017 | - | | 2.000 | Continuing | Continuing | Continuing |
| Maritime Strike - AUR | WR | NAWC-WD : China Lake, CA | 0.000 | 0.000 | | 0.500 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.500 | - |
| JMEWS | WR | NAWC-WD : China Lake, CA | 0.000 | 0.000 | | 0.000 | | 7.000 | Nov 2017 | - | | 7.000 | 0.000 | 7.000 | - |
| Prior Year Prod Dev cost no longer funded in FYDP | Various | Various : Various | 2,660.256 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2,660.256 | - |
| | | **Subtotal** | 2,674.953 | 22.817 | | 78.539 | | 114.449 | | - | | 114.449 | - | - | - |

**Remarks**

In support of M-Code, increases in FY 2018 are due to efforts associated with GPS Integration and Anti-Jam receiver activities. Funds are required for increased GPS information assurance through modernized cryptography, anti-spoofing, added resiliency and software assurance including the capability for denial of adversary navigation while improving anti-jam performance.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | Project (Number/Name)<br>0545 / *TOMAHAWK* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering - A2AD Improvements Prime Integrator (NAV/COMMS)(Raytheon)- Funds required in FY 2018 for the execution of end-to-end Tactical Tomahawk system integration testing with pre-production hardware and software to support navigation and communication upgrades required for production. | | | | | | | | | | | | | | | |
| Systems Engineering - Hardware Development (NRO)- A2AD Improvements (NAV/COMMS)- NRO FY 2018 funds waveform validation in addition to NSA certification and integration of the ground and space segments for the radio. | | | | | | | | | | | | | | | |
| Maritime Strike - AUR FY 2018 funds the development and refinement of system and subsystem seeker requirements, specifications, and interfaces; integration engineering, laboratory simulation development, prototyping of hardware and software, and captive carry flights of seeker suites by the Prime. | | | | | | | | | | | | | | | |
| PB 2017 RAA increase of $20M applied to Raytheon product development in support of component level prototype hardware procurement. This effort includes the integration of seeker hardware assemblies as suites, power management analysis and requirements for prototype seeker assemblies, and the development of prototype software builds and software simulation updates. | | | | | | | | | | | | | | | |
| FY 2018 JMEWS funding required for fuze technology maturation and risk-reduction prior to commencement of Engineering Manufacturing (EMD) and Development phase. | | | | | | | | | | | | | | | |
| FY 2018 required for TTWCS to continue to provides launch capability for both types of modernization efforts, A2AD (Nav/Comms) and Maritime, through an incremental approach to software and hardware upgrades. | | | | | | | | | | | | | | | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | SS/CPFF | ComGlobal : San Jose, CA | 2.043 | 0.000 | | 1.453 | Feb 2017 | 1.637 | Feb 2018 | - | | 1.637 | Continuing | Continuing | Continuing |
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | SS/CPFF | Boeing : St. Louis, MO | 2.820 | 0.000 | | 1.031 | Feb 2017 | 0.688 | Feb 2018 | - | | 0.688 | Continuing | Continuing | Continuing |
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | SS/CPFF | BAE Systems : San Diego, CA | 2.850 | 0.000 | | 0.237 | Feb 2017 | 0.172 | Feb 2018 | - | | 0.172 | Continuing | Continuing | Continuing |
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | SS/CPFF | Leidos : California, MD | 3.241 | 1.319 | Feb 2016 | 1.115 | Feb 2017 | 1.035 | Feb 2018 | - | | 1.035 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | Project (Number/Name)<br>0545 / *TOMAHAWK* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | SS/CPFF | UARC APL : Laurel, MD | 2.623 | 0.000 | | 0.237 | Feb 2017 | 0.172 | Feb 2018 | - | | 0.172 | Continuing | Continuing | Continuing |
| TLAM MP Analysis - Mission Planning | SS/CPFF | UARC APL : Laurel, MD | 0.300 | 0.845 | Feb 2016 | 1.059 | Feb 2017 | 1.067 | Feb 2018 | - | | 1.067 | Continuing | Continuing | Continuing |
| Imagery Format Analysis - Mission Planning | SS/CPFF | Leidos : California, MD | 4.166 | 1.164 | Feb 2016 | 1.424 | Feb 2017 | 1.418 | Feb 2018 | - | | 1.418 | Continuing | Continuing | Continuing |
| A2AD Improvements (NAV/COMMS) - Mission Planning upgrade | WR | NAWC-AD : Pax River, MD | 1.019 | 0.000 | | 0.181 | Feb 2017 | 0.192 | Feb 2018 | - | | 0.192 | Continuing | Continuing | Continuing |
| Development Support - TTWCS AUR | WR | NSWC : Dahlgren, VA | 4.067 | 0.000 | | 0.505 | Feb 2017 | 0.520 | Nov 2017 | - | | 0.520 | Continuing | Continuing | Continuing |
| Development Support - CSS AUR | SS/CPFF | Leidos : California, MD | 1.315 | 0.224 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.539 | 1.539 |
| Development Support - Advanced Concepts AUR | WR | NAWC-WD : China Lake, CA | 80.435 | 0.088 | Dec 2015 | 1.507 | Feb 2017 | 1.734 | Nov 2017 | - | | 1.734 | Continuing | Continuing | Continuing |
| Development Support - AUR Fleet Representative | SS/CPFF | UARC APL : Laurel, MD | 0.146 | 0.034 | Feb 2016 | 0.300 | Feb 2017 | 0.325 | Nov 2017 | - | | 0.325 | Continuing | Continuing | Continuing |
| Development Support - Advanced Concepts AUR | WR | NAWC-AD : Pax River, MD | 0.368 | 0.000 | | 0.097 | Feb 2017 | 0.399 | Nov 2017 | - | | 0.399 | Continuing | Continuing | Continuing |
| Development Support - CSS AUR | SS/CPFF | Various : PMA 280 Follow on CSS | 0.000 | 0.111 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Development Support - Advanced Concepts AUR | WR | NSWC : Dahlgren, VA | 0.000 | 0.048 | Feb 2016 | 0.000 | | 0.443 | Nov 2017 | - | | 0.443 | Continuing | Continuing | Continuing |
| Development Spt - CSS AUR | C/BA | Precise : Lexington Park, MD | 0.000 | 0.000 | | 0.670 | Dec 2017 | 0.982 | Dec 2017 | - | | 0.982 | 0.000 | 1.652 | - |
| Development Spt - M-Code | C/BA | UARC APL : Laurel, MD | 0.000 | 0.000 | | 0.000 | | 1.347 | Dec 2017 | - | | 1.347 | 0.000 | 1.347 | - |
| Development Spt - Maritime Strike | WR | NAWC-WD : China Lake, CA | 0.000 | 0.000 | | 0.000 | | 1.010 | Nov 2017 | - | | 1.010 | 0.000 | 1.010 | - |
| Development Spt - Maritime Strike | WR | NAWC-AD : Pax River, MD | 0.000 | 0.000 | | 0.000 | | 1.010 | Nov 2017 | - | | 1.010 | 0.000 | 1.010 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | Project (Number/Name)<br>0545 / *TOMAHAWK* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Spt - Maritime Strike | SS/CPFF | NSWC-DD : Dahlgren, VA | 0.000 | 0.000 | | 0.000 | | 1.980 | Nov 2017 | - | | 1.980 | 0.000 | 1.980 | 1.980 |
| Prior Year Support cost no longer funded in FYDP | Various | Various : Various | 274.418 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 274.418 | - |
| | | **Subtotal** | 379.811 | 3.833 | | 9.816 | | 16.131 | | - | | 16.131 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maritime Strike | C/CPFF | Raytheon : Tucson, AZ | 0.000 | 0.000 | | 2.000 | Dec 2016 | 0.000 | Dec 2017 | - | | 0.000 | Continuing | Continuing | Continuing |
| Maritime Strike | WR | NAWC-AD : China Lake, CA | 0.000 | 0.000 | | 0.500 | Dec 2016 | 1.500 | Nov 2017 | - | | 1.500 | Continuing | Continuing | Continuing |
| Maritime Strike | WR | NAWC-WD : Pax River, MD | 0.000 | 0.000 | | 0.500 | Dec 2016 | 0.425 | Nov 2017 | - | | 0.425 | 0.000 | 0.925 | - |
| Maritime Strike | WR | NSWC : Dahlgren, VA | 0.000 | 0.000 | | 0.000 | | 0.500 | Dec 2017 | - | | 0.500 | 0.000 | 0.500 | - |
| TTWCS | WR | NSWC-DD : Dahlgren | 0.000 | 0.000 | | 0.000 | | 0.612 | Dec 2017 | - | | 0.612 | 0.000 | 0.612 | - |
| Prior Year T&E cost no longer funded in FYDP | Various | Various : Various | 83.412 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 83.412 | - |
| | | **Subtotal** | 83.412 | 0.000 | | 3.000 | | 3.037 | | - | | 3.037 | - | - | - |

**Remarks**

FY 2018 Maritime Strike Test and Evaluation funding required for captive carry flight testing and other system level testing in addition to lab and component-level testing.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

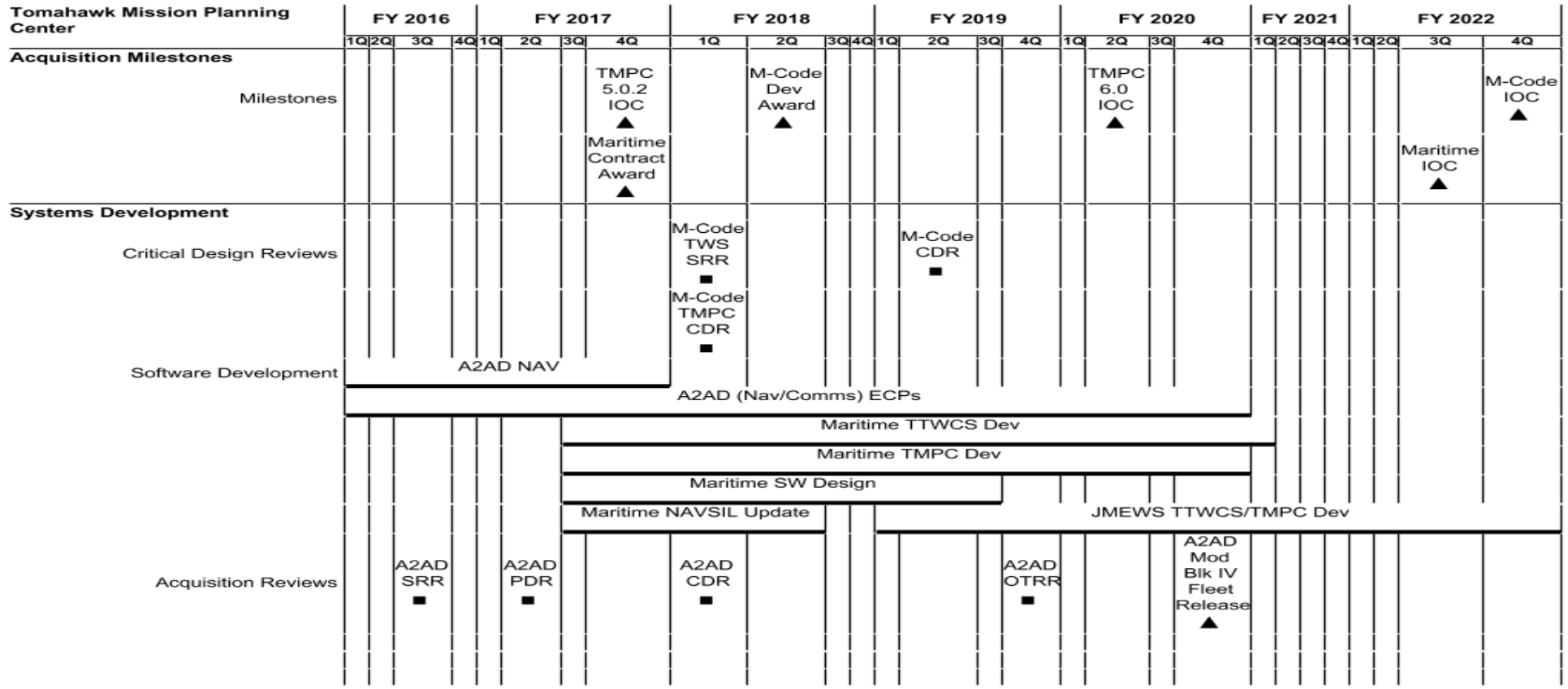
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Mgmt cost no longer funded in FYDP | Various | Various : Various | 0.401 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.401 | - |
| | | **Subtotal** | 0.401 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.401 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 3,138.577 | 26.650 | | 91.355 | | 133.617 | | - | | 133.617 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

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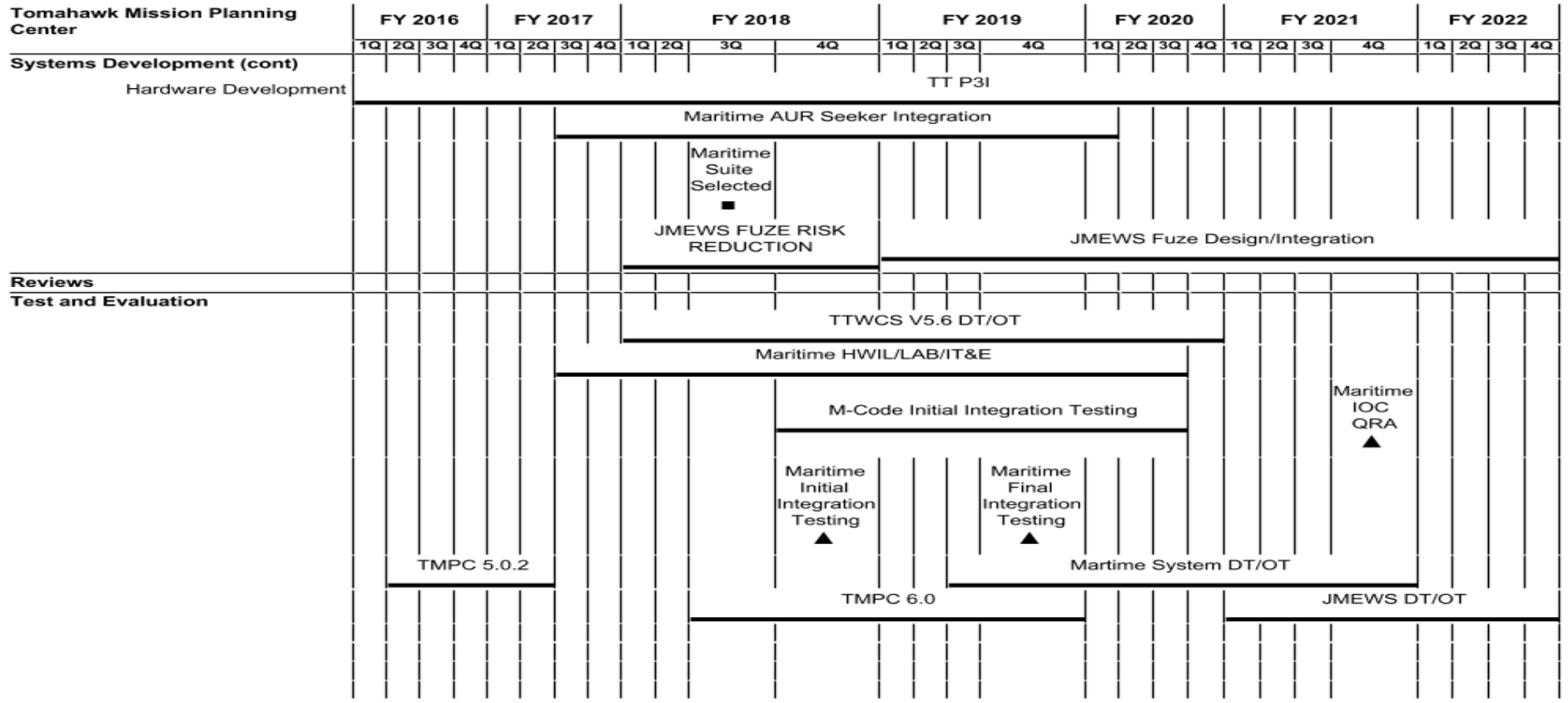
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

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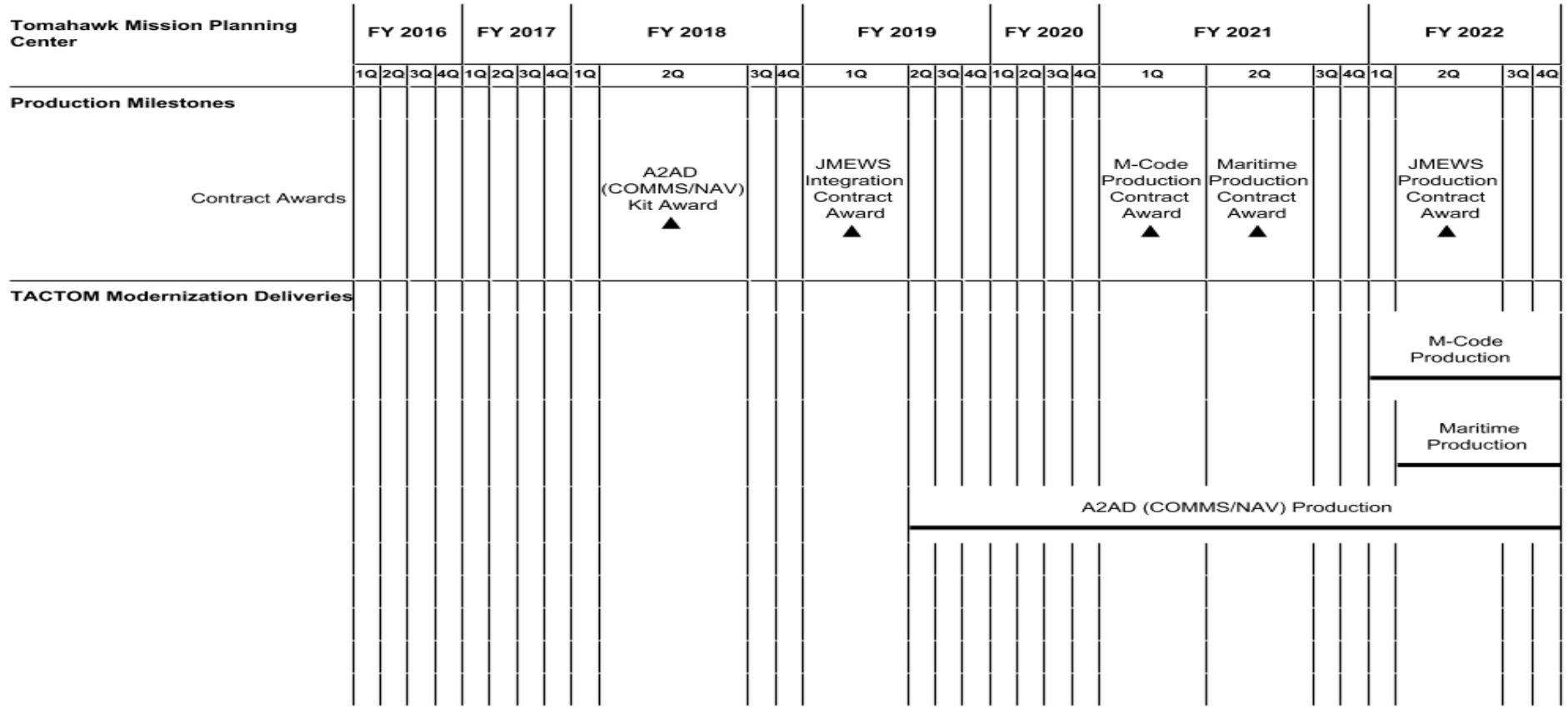
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

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| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Tomahawk Mission Planning Center*** | | | | |
| Acquisition Milestones: Milestones: TMPC 5.0.2 IOC | 4 | 2017 | 4 | 2017 |
| Acquisition Milestones: Milestones: TMPC 6.0 IOC | 2 | 2020 | 2 | 2020 |
| Acquisition Milestones: Milestones: M-Code Dev Award | 2 | 2018 | 2 | 2018 |
| Acquisition Milestones: Milestones: M-Code IOC | 4 | 2022 | 4 | 2022 |
| Acquisition Milestones: Milestones: Maritime Strike Contract Award | 4 | 2017 | 4 | 2017 |
| Acquisition Milestones: Milestones: Maritime Strike Initial Operational Capability | 3 | 2022 | 3 | 2022 |
| Systems Development: Critical Design Reviews: M-CodeTWS SRR | 1 | 2018 | 1 | 2018 |
| Systems Development: Critical Design Reviews: M-Code CDR | 2 | 2019 | 2 | 2019 |
| Systems Development: Critical Design Reviews: M-Code TMPC CDR | 1 | 2018 | 1 | 2018 |
| Systems Development: Software Development: A2AD Navigation | 1 | 2016 | 4 | 2017 |
| Systems Development: Software Development: A2AD Navigation/Communications ECPs | 1 | 2016 | 4 | 2020 |
| Systems Development: Software Development: Maritime Strike- TTWCS Development | 3 | 2017 | 1 | 2021 |
| Systems Development: Software Development: Maritime Strike- TMPC Development | 3 | 2017 | 4 | 2020 |
| Systems Development: Software Development: Maritime Strike Software Design | 3 | 2017 | 3 | 2019 |
| Systems Development: Software Development: Maritime Strike NAVSIL Update | 3 | 2017 | 2 | 2018 |
| Systems Development: Software Development: JMEWS TTWCS/TMPC Dev | 1 | 2019 | 4 | 2022 |
| Systems Development: Acquisition Reviews: A2AD - OTRR | 4 | 2019 | 4 | 2019 |
| Systems Development: Acquisition Reviews: A2AD - SRR | 3 | 2016 | 3 | 2016 |
| Systems Development: Acquisition Reviews: A2AD - PDR | 2 | 2017 | 2 | 2017 |
| Systems Development: Acquisition Reviews: A2AD Modernization Blk IV Fleet Release | 4 | 2020 | 4 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Systems Development: Acquisition Reviews: A2AD - CDR | 1 | 2018 | 1 | 2018 |
| ***Tomahawk Mission Planning Center - Page 2*** | | | | |
| Systems Development (cont): Hardware Development: TT Preplanned Product Improvement (P3I) | 1 | 2016 | 4 | 2022 |
| Systems Development (cont): Hardware Development: Maritime Strike - AUR Seeker Integration | 3 | 2017 | 1 | 2020 |
| Systems Development (cont): Hardware Development: Maritime Strike Suite Selected | 3 | 2018 | 3 | 2018 |
| Systems Development (cont): Hardware Development: JMEWS FUZE RISK REDUCTION | 1 | 2018 | 4 | 2018 |
| Systems Development (cont): Hardware Development: JMEWS Warhead and Fuze Design/Integration | 1 | 2019 | 4 | 2022 |
| Test and Evaluation: TTWCS V5.6 Modernized Missile DT/OT | 1 | 2018 | 4 | 2020 |
| Test and Evaluation: Maritime Strike - HWIL/LAB/Integration Testing | 3 | 2017 | 3 | 2020 |
| Test and Evaluation: M-Code Initial Integration Testing/Qual | 4 | 2018 | 3 | 2020 |
| Test and Evaluation: Maritime Strike IOC QRA | 4 | 2021 | 4 | 2021 |
| Test and Evaluation: Maritime Strike Initial Integration Testing | 4 | 2018 | 4 | 2018 |
| Test and Evaluation: Maritime Strike Final Integration Testing | 4 | 2019 | 4 | 2019 |
| Test and Evaluation: Martime Strike Testing | 3 | 2019 | 4 | 2021 |
| Test and Evaluation: TMPC 5.0.2 | 2 | 2016 | 2 | 2017 |
| Test and Evaluation: TMPC 6.0 | 3 | 2018 | 4 | 2019 |
| Test and Evaluation: JMEWS DT/OT | 1 | 2021 | 4 | 2022 |
| ***Tomahawk Mission Planning Center - Page 3*** | | | | |
| Production Milestones: Contract Awards: A2AD (COMMS/NAV) Kit Award | 2 | 2018 | 2 | 2018 |
| Production Milestones: Contract Awards: MGUE Production Contract Award | 1 | 2021 | 1 | 2021 |
| Production Milestones: Contract Awards: Maritime Strike Production Contract Award | 2 | 2021 | 2 | 2021 |
| Production Milestones: Contract Awards: JMEWS Integration Contract Award | 1 | 2019 | 1 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204229N / *Tomahawk Mssn Planning Ctr* | **Project (Number/Name)**<br>0545 / *TOMAHAWK* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Production Milestones: Contract Awards: JMEWS Production Contract Award | 2 | 2022 | 2 | 2022 |
| TACTOM Modernization Deliveries: M-Code Production | 1 | 2022 | 4 | 2022 |
| TACTOM Modernization Deliveries: Maritime Strike Production | 2 | 2022 | 4 | 2022 |
| TACTOM Modernization Deliveries: A2AD (COMMS/NAV) Production | 2 | 2019 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204311N *I Integrated Surveillance System* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 457.401 | 76.204 | 58.542 | 38.972 | 11.600 | 50.572 | 40.135 | 49.878 | 58.550 | 59.704 | Continuing | Continuing |
| 0344: *SUB AUXILIARIES* | 4.482 | 0.843 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.325 |
| 0766.: *IUSS Detect/Classif System* | 452.919 | 75.361 | 58.542 | 38.972 | 11.600 | 50.572 | 40.135 | 49.878 | 58.550 | 59.704 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This Program Element (PE) comprises two projects - 0766 and 0344. Project 0766 provides for Integrated Undersea Surveillance Systems (IUSS) Research and Development Projects under the Maritime Surveillance Systems (MSS) Program Office (PEO SUB PMS 485). IUSS provides the Navy with its primary means of submarine detection both nuclear and diesel. A portion of project 0766 (FSS) is classified, with details available at a higher classification level. Project 0344 funded the Shallow Water Surveillance System (SWSS) project to develop and demonstrate the technology to enable autonomous installation of a passive acoustic array with processing and communications gear.

The IUSS Research and Development project (0766) funds SURTASS Passive and SURTASS Low Frequency Active (LFA) developments. SURTASS provides the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms or other vessels of interest. SURTASS LFA provides an active adjunct capability for IUSS passive and tactical sensors to assist in countering the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters.

Development and improvement continues on the common IUSS processor based on NAVSEA's Acoustic Rapid COTS Insertion (ARCI) program with a cyclical tech refresh of hardware and software in conjunction with the submarine Advanced Processor Build (APB) process. The IUSS Integrated Common Processor (ICP) has the capability to process and display data from all fixed and mobile underwater systems. The IUSS ICP is used for all new system installations and replaces the legacy systems as they reach end of life and require upgrading. Additionally, SURTASS consolidated on the TB-29A Twin-line array, a variant of the Submarine TB-29A Long line array. This reduced the number of array variants employed by SURTASS from 3 to 1, and enabled development and logistics cost savings by leveraging off the submarine TB-29A program.

In FY16, funds were reprogrammed to complete the first prototype contracting and deployment in support of the Navy's Theater Anti-Submarine Warfare (TASW) Offset Strategy. This is Military Intelligence Program (MIP).

In FY17, the IUSS Research and Development project (0766) funds the second major prototype contracting and deployment to support the Navy's TASW Offset Strategy. This is a MIP.

In FY18, the IUSS Research and Development project (0766) funds the third major prototype contracting and deployment to support the Navy's TASW Offset Strategy. This is a MIP.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204311N *I Integrated Surveillance System* |

FY18 OCO request of $11.600M is to support the TASW FY18 European Initiative Program Budget Recommendation (ERI PBR). The TASW ERI PBR responds to an urgent EUROCOM/AFRICOM requirement for additional maritime intelligence, surveillance, and reconnaissance capabilities. PEOSUB, in conjunction with COMSUBFOR and CNO, directed a rapid prototyping program be undertaken utilizing systems developed by the Office of Naval Research (ONR), the Defense Advanced Research Projects Agency (DARPA) and the Naval Undersea Warfare Center (NUWC). Development of TASW capabilities to meet TASW requirements against evolving threats in the EUROCOM/AFRICOM Area of Responsibility (AOR) will also serve to address similar requirements globally.

The Shallow Water Surveillance System (SWSS) project (0344) funds the development and demonstration of the Version 1 system with technology to enable autonomous classification and reporting of specific submarine targets of interest.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 49.587 | 58.542 | 29.903 | - | 29.903 |
| Current President's Budget | 76.204 | 58.542 | 38.972 | 11.600 | 50.572 |
| Total Adjustments | 26.617 | 0.000 | 9.069 | 11.600 | 20.669 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 26.617 | 0.000 | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 9.000 | 11.600 | 20.600 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.069 | - | 0.069 |

**Change Summary Explanation**

Program Adjustments:
Increase of $26.6M in FY16 is to support the TASW initiative.
Increase of $8.9M in FY18 is to support IUSS wholeness ($1.2M SURTASS/$7.7M FSS).
Increase of $11.6M in FY18 OCO is to support continued funding for the TASW ERI PBR.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204311N / *Integrated Surveillance System* | Project (Number/Name)<br>0344 / *SUB AUXILIARIES* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0344: *SUB AUXILIARIES* | 4.482 | 0.843 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.325 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Shallow Water Surveillance System (SWSS) project (0344) funded the development and demonstration of the Version 1 system with technology to enable autonomous classification and reporting of specific submarine targets of interest.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** SWSS | 0.843 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>FY16 funding will be used to implement features for system ruggedization and reliability testing. | | | | | |
| ***FY 2017 Plans:***<br>Removed all existing SWSS development funding beginning in FY17 to fund higher priority investments during budget integration | | | | | |
| ***FY 2018 Base Plans:***<br>N/A | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.843 | 0.000 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204311N / *Integrated Surveillance System* | Project (Number/Name)<br>0766. / *IUSS Detect/Classif System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0766.: *IUSS Detect/Classif System* | 452.919 | 75.361 | 58.542 | 38.972 | 11.600 | 50.572 | 40.135 | 49.878 | 58.550 | 59.704 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

A. This project includes efforts for SURTASS and the Theater ASW Offset Initiative. The SURTASS project comprises the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms against both diesel and nuclear powered submarines. SURTASS also provides the undersea surveillance necessary to support regional conflicts and sea-lane protection. SURTASS has experienced recent passive and active success against diesel submarines operating in shallow water. SURTASS is leveraging existing developments and reducing costs by using Non-Developmental Items and commercial hardware, supporting common Navy Undersea Warfare processing and towed array developments, and increasing operator efficiency through computer-aided detection and classification processing. SURTASS development efforts include LFA/CLFA improvements, common IUSS processing, twin-line array development and processing, improved detection and classification/passive automation to counter quieter threats, additional signal processing, integrated active and passive operations, improved Battle Group support, and improved information processing.

LFA provides an active adjunct capability for IUSS passive and tactical sensors to counter the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow, quiet threats in harsh littoral waters. Improvements include TL-29A/LFA integration enhancements, advanced waveforms for littoral/shallow water operations including Doppler sensitive waveforms, and processing algorithms to reduce clutter and reverberation false alarms in shallow water. The Integrated Common Processor (ICP) is a derivative of the NAVSEA Submarine Acoustic Rapid Commercial Off the Shelf (COTS) Insertion (ARCI) program, and is being augmented for IUSS requirements. Together, the LFA/CLFA improvements, TL-29A, and the ICP support the SURTASS Active Improvement Program.

Functional improvements to ICP are delivered to the Fleet in software "builds" while hardware improvements are delivered through the Tech Insertion (TI) process. Software improvements delivered via the Advanced Surveillance Build (ASB) process are based on the Advanced Processor Build (APB) process begun by the NAVSEA Submarine USW program. Each ASB will introduce new capabilities into SURTASS systems including improved automation, normalizer techniques, adaptive beam forming, and display enhancements. SURTASS participates in the process by contributing algorithms for consideration, supplying peer group members for review of candidate algorithms, participating in test evolutions, and incorporating improved algorithms into operational systems. The TI process, modeled after the NAVSEA Submarine USW hardware improvement program, delivers processing technology improvements to platforms on roughly a 4-6 year cycle. Hardware upgrades for active and passive arrays and communications systems will also be provided during TI upgrades, but not on a regular planned development cycle as for the processing upgrades.

B. PEO SUB is involved with the development and maintenance of various IUSS systems. These systems include Fixed Distributed systems (FDS), Fixed Distributed Systems-Commercial (FDS-C), and SURTASS. The existing system architectures, signal processing, contact management, and reporting requirements will be evaluated as well as the requirements for future systems. The cyclical development of the ICP will take advantage of automation advancement, array technology improvements, along with IUSS, submarine, and surface USW system commonality to address these requirements.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

C. Theater Anti-Submarine Warfare Strategy (TASW) Offset Initiative responds to an urgent EUROCOM/AFRICOM requirement for additional maritime intelligence, surveillance, and reconnaissance capabilities. PEOSUB, in conjunction with COMSUBFOR and CNO, directed a rapid prototyping program be undertaken utilizing systems developed by the Office of Naval Research (ONR), the Defense Advanced Research Projects Agency (DARPA) and the Naval Undersea Warfare Center (NUWC). Development of TASW capabilities to meet TASW requirements against evolving threats in the EUROCOM/AFRICOM Area of Responsibility (AOR) will also serve to address similar requirements globally.
The FSS portion of 0766 is classified with details available at a higher classification level.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Integrated Common Processor (ICP) | 9.807 | 13.866 | 15.831 | 0.000 | 15.831 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Project continued development of operator automation to allow operator to more quickly detect targets of interest. Specific focus placed on compensating for array shape in a ship maneuver as well as system improvements to alert the operator of potential targets of interest in both the active and passive realms. Project continued to develop software to implement technology refresh for SURTASS ships as well as in support of the Integrated Undersea Surveillance Systems' (IUSS) Advanced Surveillance Build (ASB) in coordination with the Submarine Acoustic Rapid Commercial Off The Shelf (COTS) Insertion (ARCI) program Advanced Processor Build (APB). Project continued to address processing improvement recommendations and deficiencies associated with Compact Low Frequency Active (CLFA) Developmental Testing (DT)/Operational Testing (OT) and LFA Follow-On Operational Test & Evaluation (FOT&E). Project updated processing to provide seamless integration of active/passive processing to support geo-centric contact-based search. Project investigated methods to reduce surface ship clutter in order to enhance detection performance. Project supported technical insertion hardware replacement to enhance ICP surveillance capability. | | | | | |
| ***FY 2017 Plans:***<br>Develop advanced Undersea Warfare (USW) sensor technology and associated processor and Advanced Surveillance Build (ASB) processing to enhance capabilities necessary to meet Key Performance Parameters against adversary's advanced submarines. Both processing and sensors are required to detect increasingly quiet threats in a cluttered environment with the emerging situation of insufficient numbers of qualified Fleet operators available to staff. These CNO high priority systems provide for the requirement to increase focus on operator workload reduction and processing capability enhancement/development as well as increased sensitivity of sensors. Continue to investigate methods to reduce surface ship clutter in order to enhance | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| detection performance. Continue to support technical insertion hardware replacement to enhance ICP surveillance capability.<br>***FY 2018 Base Plans:***<br>Develop advanced Undersea Warfare (USW) sensor technology and associated processor and Advanced Surveillance Build (ASB) processing to enhance capabilities necessary to meet Key Performance Parameters against adversary's advanced submarines. Both processing and sensors are required to detect increasingly quiet threats in a cluttered environment with the emerging situation of insufficient numbers of qualified Fleet operators available to staff. These CNO high priority systems provide for the requirement to increase focus on operator workload reduction and processing capability enhancement/development as well as increased sensitivity of sensors. Work will include development of software updates for afloat ICP installations and associated Engineering Measurements Program (EMP) systems. Continue to investigate methods to reduce surface ship clutter in order to enhance detection performance to include incorporation of Passive Sonar Automation Technology (PSAT) aspects. Continue to support technical insertion 18 hardware replacement to enhance ICP surveillance capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Compact Low Frequency Active (CLFA)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Continued product improvement and upgrade efforts associated with CLFA DT/OT and LFA FOT&E. Conducted pierside and at-sea test and evaluation efforts to research alternative LFA/CLFA system performance enhancements. Conducted dockside cyber security testing as part of FOT&E.<br>***FY 2017 Plans:***<br>Continue product improvement and upgrade efforts associated with CLFA DT/OT and LFA FOT&E. Develop cyber security enhancements. Conduct pierside and at-sea test and evaluation efforts to research alternative LFA/CLFA system performance enhancements. Conduct dockside cyber security testing as part of FOT&E.<br>***FY 2018 Base Plans:*** | 1.750<br>- | 2.000<br>- | 2.000<br>- | 0.000<br>- | 2.000<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue product improvement and upgrade efforts associated with CLFA DT/OT and LFA FOT&E. Develop cyber security enhancements. Conduct pierside and at-sea test and evaluation efforts to research alternative LFA/CLFA system performance enhancements. Conduct dockside cyber security testing as part of FOT&E.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TB-29A/Twin-Line | 1.750 | 2.000 | 2.000 | 0.000 | 2.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued development of true fiber optic array technologies and array components with reduced connection points. Continued efforts to explore Twin-line variants of new submarine Long-line arrays for future application to SURTASS. Continued development of fishing net mitigation approaches and associated test and evaluation efforts to facilitate operations in littoral waters. Developed upgraded components to address component obsolescence. Improvements intended to increase sensor capability, improve operational reliability, and reduce maintenance touch-points. | | | | | |
| ***FY 2017 Plans:***<br>Continue development of connectionless array technologies and true fiber-optic arrays. Continue efforts to explore Twin-line variants of new submarine Long-line arrays for future application to SURTASS. Continue development of fishing net mitigation approaches and associated test and evaluation efforts. Develop upgraded components to enhance system performance. Improvements intended to modernize equipment to address system deficiencies, improve operational reliability, and reduce maintenance touch-points. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue development of true fiber optic array technologies and array components with reduced connection points. Continue efforts to explore Twin-line variants of new submarine Long-line arrays for future application to SURTASS. Continue development of fishing net mitigation approaches and supports associated test and evaluation efforts to facilitate operations in littoral waters and reduced potential for array damage from fishing apparatus. Continue development of upgraded components to address component obsolescence. Improvements intended to modernize equipment to address system deficiencies, improve operational reliability, and reduce maintenance touch-points. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Theater Anti-Submarine Warfare (TASW) | 26.617 | 29.080 | 0.000 | 11.600 | 11.600 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed contract actions for eight (8) Transformational Reliable Acoustic Path System (TRAPS). Completed deployment of 1st TASW prototype barriers. Preliminary staging, planning, and preparation for the Q1FY17 TASW prototype operations.<br>***FY 2017 Plans:***<br>Preliminary staging, planning and preparation for the Q1FY18 TASW prototype operations. Complete contract action for second barrier of prototype units. Complete deployment of second barrier prototype units.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>Execute Q1 FY18 TASW prototype operations preliminary staging, planning and preparation for the Q1FY19 TASW prototype operations. Complete contract actions for additional prototype units to augment existing prototype barriers. Complete deployment of additional prototype units.<br>Recover and demilitarize TASW hardware in FY19 following completion of TASW FY19 prototype operations | | | | | |
| ***Title:*** Classified Effort | 35.437 | 11.596 | 19.141 | 0.000 | 19.141 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The FSS portion of 0766 is classified with details available at a higher classification level.<br>***FY 2016 Accomplishments:***<br>The FSS portion of 0766 is classified with details available at a higher classification level.<br>***FY 2017 Plans:***<br>The FSS portion of 0766 is classified with details available at a higher classification level.<br>***FY 2018 Base Plans:***<br>The FSS portion of 0766 is classified with details available at a higher classification level.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 75.361 | 58.542 | 38.972 | 11.600 | 50.572 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2237: *Surveillance Towed Array Sensor System* | 26.153 | 46.136 | 30.180 | - | 30.180 | 19.918 | 23.254 | 28.545 | 25.545 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

FY 2010: T&E Milestones: CLFA/TL-29A/ICP DT.
FY 2011: Engineering Milestones: ICP Tech Refresh.
FY 2011: T&E Milestones: CLFA/TL-29A/ICP DT. LFA/TL-29A/ICP FOT&E.
FY 2012: T&E Milestones: CLFA/TL-29A/ICP DT/OT. LFA/TL-29A/ICP FOT&E.
FY 2013: LFA/TL-29A/ICP FOT&E.
FY 2014: ICP Tech Refresh. CLFA OT/CLFA/TL-29A/ICP FOT&E
FY 2015: ICP Tech Refresh. LFA/CLFA/TL-29A/ICP FOT&E
FY 2016: ICP Tech Refresh. ASB Step 4 Testing.
FY 2017: ICP Tech Refresh. CLFA/TL-29A/ICP FOT&E
FY 2018: ICP Tech Refresh. ASB Step 4 Testing.
The FSS portion of 0766 is classified with details available at a higher classification level.

**E. Performance Metrics**

Successfully complete CLFA Operational Test Readiness Review. Successfully complete CLFA Developmental Test / Operational Test. Successful demonstration of required LFA/CLFA improvements capability. Successful transition of Submarine Advanced Processing Build (APB) functionality and advanced capabilities into IUSS products. Successful transition of net mitigation technologies into Towed Array baseline.
The FSS portion of 0766 is classified with details available at a higher classification level.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204311N / *Integrated Surveillance System* | Project (Number/Name)<br>0766. / *IUSS Detect/Classif System* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IUSS COMMON ARCHITECTURE | C/CPFF | LOCKHEED MARTIN : VA | 29.610 | 4.034 | Dec 2015 | 5.566 | Feb 2017 | 6.394 | Dec 2017 | - | | 6.394 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | SS/CPFF | APL/JHU : MD | 2.721 | 0.640 | Feb 2016 | 0.767 | Apr 2017 | 0.914 | Feb 2018 | - | | 0.914 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | Various | VARIOUS : Not Specified | 66.596 | 1.093 | Dec 2015 | 2.004 | Jan 2017 | 2.056 | Dec 2017 | - | | 2.056 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | C/CPFF | ADAPTIVE Methods : VA | 2.150 | 0.500 | Dec 2015 | 0.687 | Feb 2017 | 0.792 | Dec 2017 | - | | 0.792 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | WR | NFESC : CA | 1.807 | 0.363 | Dec 2015 | 0.414 | Mar 2017 | 0.413 | Dec 2017 | - | | 0.413 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | WR | SSC PAC : CA | 1.342 | 0.205 | Dec 2015 | 0.199 | Jan 2017 | 0.172 | Dec 2017 | - | | 0.172 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | SS/CPFF | APL/JHU : MD | 2.293 | 0.522 | Feb 2016 | 0.512 | Apr 2017 | 0.446 | Feb 2018 | - | | 0.446 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | Various | VARIOUS : Not Specified | 117.072 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 117.072 | - |
| ARRAY IMPROVEMENTS | SS/CPFF | APL/JHU : VA | 2.623 | 0.842 | Feb 2016 | 0.920 | Apr 2017 | 0.901 | Feb 2018 | - | | 0.901 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | SS/CPFF | ADAPTIVE METHODS : VA | 0.989 | 0.258 | Jan 2016 | 0.339 | Feb 2017 | 0.401 | Jan 2018 | - | | 0.401 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | Various | VARIOUS : Not Specified | 9.405 | 0.355 | Dec 2015 | 0.441 | Jan 2017 | 0.407 | Dec 2017 | - | | 0.407 | Continuing | Continuing | Continuing |
| TASW FIELDING | Various | SSC PAC : CA | 0.731 | 2.353 | Dec 2016 | 1.337 | Jan 2017 | 0.000 | | 0.100 | Nov 2017 | 0.100 | 0.000 | 4.521 | - |
| TASW FIELDING | Various | NUWC NEWPORT : RI | 0.300 | 0.853 | Aug 2016 | 0.425 | Mar 2017 | 0.000 | | 0.300 | Feb 2018 | 0.300 | 0.000 | 1.878 | - |
| TASW FIELDING | SS/CPFF | APL/UW : WA | 6.740 | 5.335 | Feb 2017 | 5.501 | May 2017 | 0.000 | | 0.900 | Feb 2018 | 0.900 | 0.000 | 18.476 | - |
| TASW FIELDING | C/CPFF | L3 CSC : MD | 0.000 | 2.335 | Feb 2017 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.335 | - |
| TASW FIELDING | Various | VARIOUS : CA | 0.461 | 1.422 | Jan 2017 | 1.484 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 3.367 | - |
| TASW FIELDING | C/CPFF | LEIDOS : CA | 23.652 | 11.206 | Dec 2016 | 14.323 | May 2017 | 0.000 | | 5.400 | Feb 2018 | 5.400 | 0.000 | 54.581 | - |
| TASW FIELDING | Various | NSWC CARDEROCK : MD | 0.075 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.075 | - |
| TASW FIELDING | C/CPFF | PROTEQ : VA | 0.000 | 1.180 | Mar 2017 | 1.900 | May 2017 | 0.000 | | 1.000 | Jan 2018 | 1.000 | 0.000 | 4.080 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TASW FIELDING | SS/CPFF | SANDIA : NM | 0.000 | 0.000 | | 0.621 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.621 | - |
| TASW FIELDING | WR | NAVY OCEANOGRAPHIC OFFICE : MS | 0.000 | 0.000 | | 0.000 | | 0.000 | | 0.200 | Feb 2018 | 0.200 | 0.000 | 0.200 | - |
| TASW FIELDING | C/CPFF | OASIS : MA | 0.000 | 0.000 | | 0.000 | | 0.000 | | 0.300 | Feb 2018 | 0.300 | 0.000 | 0.300 | - |
| FSS - Classified | Various | TBD : Not Specified | 102.647 | 35.437 | Nov 2015 | 11.596 | Nov 2016 | 19.141 | Nov 2017 | - | | 19.141 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 371.214 | 68.933 | | 49.036 | | 32.037 | | 8.200 | | 40.237 | - | - | - |

**Remarks**

The FSS portion of 0766 is classified with details available at a higher classification level.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IUSS COMMON ARCHITECTURE | WR | SSC PAC : CA | 3.992 | 0.250 | Dec 2015 | 0.381 | Jan 2017 | 0.421 | Dec 2017 | - | | 0.421 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | C/CPFF | APL/JHU : MD | 1.411 | 0.700 | Feb 2016 | 1.031 | Apr 2017 | 1.173 | Dec 2017 | - | | 1.173 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | C/CPFF | Lockheed Martin : VA | 2.552 | 0.700 | Dec 2015 | 0.906 | Feb 2017 | 1.035 | Dec 2017 | - | | 1.035 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | Various | VARIOUS : Not Specified | 4.626 | 0.280 | Dec 2015 | 0.397 | Jan 2017 | 0.423 | Dec 2017 | - | | 0.423 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | WR | SSC PAC : CA | 0.778 | 0.150 | Dec 2015 | 0.195 | Jan 2017 | 0.213 | Dec 2017 | - | | 0.213 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | Various | VARIOUS : Not Specified | 7.555 | 0.075 | Jan 2016 | 0.141 | Feb 2017 | 0.184 | Jan 2018 | - | | 0.184 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | Various | VARIOUS : Not Specified | 1.352 | 0.200 | Jan 2016 | 0.200 | Feb 2017 | 0.191 | Jan 2018 | - | | 0.191 | Continuing | Continuing | Continuing |
| TASW FIELDING | WR | NUWC NEWPORT : MA | 0.000 | 0.180 | Jan 2017 | 0.250 | May 2017 | 0.000 | | 0.700 | Nov 2017 | 0.700 | 0.000 | 1.130 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204311N / *Integrated Surveillance System* | Project (Number/Name)<br>0766. / *IUSS Detect/Classif System* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TASW FIELDING | WR | NUWC KEYPORT : WA | 0.000 | 0.400 | Jan 2017 | 0.640 | May 2017 | 0.000 | | 0.700 | Nov 2017 | 0.700 | 0.000 | 1.740 | - |
| TASW FIELDING | SS/CPFF | APL/JHU : MD | 0.000 | 0.350 | Nov 2016 | 0.150 | Feb 2017 | 0.000 | | 0.100 | Jan 2018 | 0.100 | 0.000 | 0.600 | - |
| TASW FIELDING | WR | SSC PAC : CA | 0.000 | 0.000 | | 0.700 | May 2017 | 0.000 | | 1.200 | Nov 2017 | 1.200 | 0.000 | 1.900 | - |
| | | **Subtotal** | 22.266 | 3.285 | | 4.991 | | 3.640 | | 2.700 | | 6.340 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IUSS COMMON ARCHITECTURE | C/CPFF | LOCKHEED MARTIN : VA | 3.641 | 0.700 | Dec 2015 | 0.846 | Jan 2017 | 1.014 | Dec 2017 | - | | 1.014 | Continuing | Continuing | Continuing |
| IUSS COMMON ARCHITECTURE | Various | VARIOUS : Not Specified | 7.831 | 0.375 | Dec 2015 | 0.550 | Mar 2017 | 0.741 | Dec 2017 | - | | 0.741 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | WR | OPTEVFOR : VA | 0.462 | 0.090 | Mar 2016 | 0.095 | Feb 2017 | 0.089 | Mar 2018 | - | | 0.089 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | Various | VARIOUS : Not Specified | 20.849 | 0.070 | Dec 2015 | 0.084 | Mar 2017 | 0.087 | Dec 2017 | - | | 0.087 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | SS/CPFF | APL/JHU : MD | 0.705 | 0.185 | Feb 2016 | 0.235 | Apr 2017 | 0.253 | Feb 2018 | - | | 0.253 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | Various | VARIOUS : Not Specified | 2.768 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| TASW FIELDING | WR | NUWC NEWPORT : MA | 0.000 | 0.149 | Oct 2016 | 0.250 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.399 | - |
| TASW FIELDING | WR | NAVY OCEANOGRAPHIC OFFICE : MS | 0.000 | 0.854 | Apr 2017 | 0.800 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.654 | - |
| | | **Subtotal** | 36.256 | 2.423 | | 2.860 | | 2.184 | | - | | 2.184 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

**Management Services ($ in Millions)**

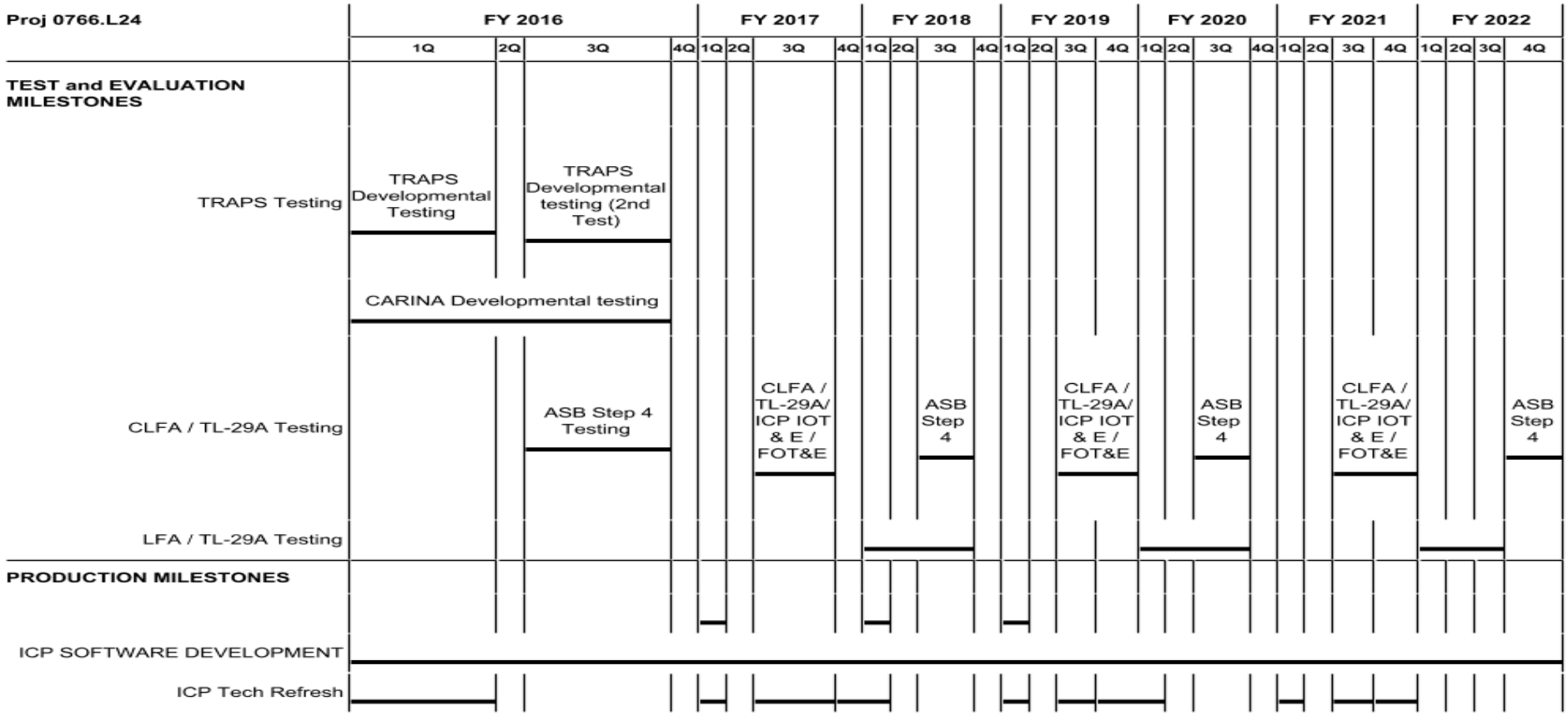
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IUSS COMMON ARCHITECTURE | Various | VARIOUS : Not Specified | 6.575 | 0.535 | Mar 2016 | 0.730 | Mar 2017 | 0.869 | Mar 2018 | - | | 0.869 | Continuing | Continuing | Continuing |
| ACTIVE IMPROVEMENT/ CLFA/LFA | Various | VARIOUS : Not Specified | 15.760 | 0.090 | Mar 2016 | 0.125 | Mar 2017 | 0.142 | Mar 2018 | - | | 0.142 | Continuing | Continuing | Continuing |
| ARRAY IMPROVEMENTS | Various | VARIOUS : Not Specified | 0.463 | 0.095 | Mar 2016 | 0.100 | Mar 2017 | 0.100 | Mar 2018 | - | | 0.100 | Continuing | Continuing | Continuing |
| TASW FIELDING | C/CPFF | BAH : VA | 0.385 | 0.000 | | 0.700 | Jun 2017 | 0.000 | | 0.700 | Jan 2018 | 0.700 | 0.000 | 1.785 | - |
| | | **Subtotal** | 23.183 | 0.720 | | 1.655 | | 1.111 | | 0.700 | | 1.811 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 452.919 | 75.361 | | 58.542 | | 38.972 | | 11.600 | | 50.572 | - | - | - |

**Remarks**

The R3 and the R4 / R4A reflect the UNCLASSIFIED portion of the PE.
The FSS portion of 0766 is classified with details available at a higher classification level.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |




*2018OSD - 0204311N - 0766.L24*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0766.L24*** | | | | |
| TEST and EVALUATION MILESTONES: TRAPS Testing: TRAPS Developmental testing | 1 | 2016 | 1 | 2016 |
| TEST and EVALUATION MILESTONES: TRAPS Testing: TRAPS Developmental testing (2nd test) | 3 | 2016 | 3 | 2016 |
| TEST and EVALUATION MILESTONES: TRAPS Testing: CARINA Developmental testing | 1 | 2016 | 3 | 2016 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4 Testing | 3 | 2016 | 3 | 2016 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2017) | 3 | 2017 | 3 | 2017 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4 (3rd qtr FY18) | 3 | 2018 | 3 | 2018 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2019) | 3 | 2019 | 4 | 2019 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4 | 3 | 2020 | 3 | 2020 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2021) | 3 | 2021 | 4 | 2021 |
| TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4 | 4 | 2022 | 4 | 2022 |
| TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA / TL-29A/ ICP FOT & E (COMPLETE 2018) | 1 | 2018 | 3 | 2018 |
| TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA / TL-29A/ ICP FOT & E (COMPLETE 2020) | 1 | 2020 | 3 | 2020 |
| TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA /TL-29A/ICP FOT & E (COMPLETE 2022) | 1 | 2022 | 3 | 2022 |
| PRODUCTION MILESTONES: Field First Segment TRAPS/Carina | 1 | 2017 | 1 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204311N / *Integrated Surveillance System* | **Project (Number/Name)**<br>0766. / *IUSS Detect/Classif System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| PRODUCTION MILESTONES: Field Second Segment TRAPS | 1 | 2018 | 1 | 2018 |
| PRODUCTION MILESTONES: Field Third Segment TRAPS/CARINA | 1 | 2019 | 1 | 2019 |
| PRODUCTION MILESTONES: ICP SOFTWARE DEVELOPMENT: ICP Software Development | 1 | 2016 | 4 | 2022 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY15 | 1 | 2016 | 1 | 2016 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY17 | 1 | 2017 | 1 | 2017 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY17 | 3 | 2017 | 3 | 2017 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY17 | 4 | 2017 | 1 | 2018 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY19 | 1 | 2019 | 1 | 2019 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY19 | 3 | 2019 | 3 | 2019 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY19 | 4 | 2019 | 1 | 2020 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY21 | 1 | 2021 | 1 | 2021 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY21 | 3 | 2021 | 3 | 2021 |
| PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY21 | 4 | 2021 | 4 | 2021 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204413N / *Amphibious Tactical Supt Units* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 35.084 | 11.330 | 13.929 | 3.940 | - | 3.940 | 1.898 | 1.244 | 1.286 | 1.313 | Continuing | Continuing |
| 2231: *LCAC / LCU 1700* | 34.502 | 11.330 | 10.536 | 1.650 | - | 1.650 | 1.185 | 1.244 | 1.286 | 1.313 | Continuing | Continuing |
| 2909: *Amphibious Lighterage Development* | 0.582 | 0.000 | 3.393 | 2.290 | - | 2.290 | 0.713 | 0.000 | 0.000 | 0.000 | 0.000 | 6.978 |

**A. Mission Description and Budget Item Justification**

Landing Craft Air Cushion (LCAC) Technology Transition: Provides for research and development efforts on LCAC Future Naval Capabilities to transfer technologies to functional uses on current LCACs. Current technology initiatives include sustainability/readiness/performance analyses, LCAC communication improvements, development and qualification of Full Authority Digital Engine Controller (FADEC) for LCAC engines, compliance with Cybersecurity policy regulations, and LCAC fuel efficiency initiatives.

LCU 1700 (formerly Surface Connector X Replacement (SC(X)(R))): Replacement program for the current Landing Craft Utility (LCU) 1610 class craft - a class of craft that has significantly exceeded its 20-year planned service life. LCU 1700 will provide similar payload, range, speed, and interoperability. Contract award is planned for 2017.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 11.335 | 13.929 | 1.646 | - | 1.646 |
| Current President's Budget | 11.330 | 13.929 | 3.940 | - | 3.940 |
| Total Adjustments | -0.005 | 0.000 | 2.294 | - | 2.294 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.005 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 2.500 | - | 2.500 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.206 | - | -0.206 |

**Change Summary Explanation**

FY 2018 net increase of $2.294 million is to support continued development of the Amphibious Support Craft Vehicle.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204413N / *Amphibious Tactical Supt Units* | Project (Number/Name)<br>2231 / *LCAC / LCU 1700* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2231: *LCAC / LCU 1700* | 34.502 | 11.330 | 10.536 | 1.650 | - | 1.650 | 1.185 | 1.244 | 1.286 | 1.313 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Landing Craft Air Cushion (LCAC) Technology Transition: Provides for research and development efforts on LCAC Future Naval Capabilities to transfer technologies to functional uses on current LCACs. Current technology initiatives include sustainability/readiness/performance analyses, LCAC communication improvements, development and qualification of Full Authority Digital Engine Controller (FADEC) for LCAC engines, compliance with Cybersecurity policy regulations, and LCAC fuel efficiency initiatives.

LCU 1700 (formerly SC (X)(R)): Replacement program for the current Landing Craft Utility (LCU) 1610 class craft - a class of craft that has significantly exceeded its 20-year planned service life. LCU 1700 will provide similar payload, range, speed, and interoperability. Contract award is planned for 2017.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** LCAC RDT&E,N and LCU 1700 | 11.330 | 10.536 | 1.650 | 0.000 | 1.650 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>FY16 LCAC: Developed technologies to prevent moisture intrusion into craft windows; developed auxiliary power unit controller to improve visibility and equipment reliability. Improved the reliability of the LCAC and hardened main engines against marine corrosion. Addressed electronic charting requirements and met Windows operating system IA requirements. Completed development of LCAC equipment and procedures which maximized the sea state in which Marine Amphibious Assault Vehicles (ACVs) can be launched from a waterborne LCAC.<br><br>FY16 LCU 1700: Transitioned from Preliminary Design (PD) to Contract Design (CD). CD efforts are the next iteration of shipbuilding design, requiring significantly greater detail in order to support the effective translation of the engineering decisions and findings from the PD into a biddable technical package, including specifications and contract guidance drawings which will allow the shipbuilders to develop competitive bids once the Request for Proposal (RFP) is released.<br><br>Conducted supporting trade studies with Industry input, component or system prototype testing and modeling and simulation as needed to support the Contract Design (CD) effort. These efforts will be part of the integrated Developmental/Operational Testing approach. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204413N / *Amphibious Tactical Supt Units* | **Project (Number/Name)**<br>2231 / *LCAC / LCU 1700* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continued use of Integrated Product Teams to support development of the Test and Evaluation Master Plan (TEMP) and Life Cycle Sustainment Plan (LCSP), and initiated development of the Acquisition Strategy and other supporting Milestone documentation.<br>***FY 2017 Plans:***<br>FY17 LCAC: Improve reliability and maintainability of the LCAC HM&E systems including testing a composite ramp to reduce maintenance and repair costs, software development and testing to improve powertrain performance, redesigning hydraulic flex lines as well as bow thruster bearings to extend MTBF, and developing and testing new methods for well deck lifting procedures. Develop updates to meet Windows 10 Operating System IA requirements and cybersecurity needs. Complete mandated migration to electronic charting. Address C4N obsolescence, usability and maintenance issues.<br><br>FY17 LCU 1700: Provide risk reduction to the LCU 1700 design by continuing development in the following areas: perform hydrodynamic testing, to include self-propelled and maneuvering tests model tests and flow channel optimization of propulsor and rudders; modeling and simulation analysis, to include finite element analysis (FEA) and computational fluid dynamics (CFD); demonstrate full scale system level prototyping, utilizing LCU 1610 craft; and assessment of Windows 10 Operating System, IA requirements, and cybersecurity needs. These efforts will be part of the integrated Developmental/Operational Testing approach.<br><br>Continue use of Integrated Product Teams to support development of the Test and Evaluation Master Plan (TEMP) and Life Cycle Sustainment Plan (LCSP). Continue development of Milestone documentation supporting a combined MS B/C.<br>***FY 2018 Base Plans:***<br>FY18 LCAC: Improve reliability and maintainability of the LCAC HM&E systems to address safety concerns, reduce maintenance and repair costs, and address obsolescence issues; efforts may include testing new battery charger (VIPUR), bow thruster bearing prototype evaluation, investigating new tools/procedures to improve deep skirt maintenance. Complete the technical data package for Windows 10 updates to SBC4 and LMSS stations in accordance with DoD directives and Cybersecurity requirements; additionally, efforts will include seeking Platform IT RMF accreditation as a result of directives to implement additional Cybersecurity controls required under RMF. Complete the technical data package for electronic navigation on LCAC; in accordance with OPNAVINST 9420.2A, landing must meet electronic navigation requirements including the processing and display of DNCs and ENCs. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204413N / *Amphibious Tactical Supt Units* | **Project (Number/Name)**<br>2231 / *LCAC / LCU 1700* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| FY18 LCU 1700: Conduct risk reduction efforts and special studies/analyses which support opportunities for Life Cycle/Total Ownership Cost (TOC) reductions for the class and may address producibility improvements, increased reliability, and/or improved ease of maintenance for components or systems. Additionally, efforts will include seeking Platform IT RMF accreditation as a result of the directives to implement additional Cybersecurity controls required under RMF.<br><br>Continue use of Integrated Product Teams to support updates of the initial Test and Evaluation Master Plan (TEMP), Life Cycle Sustainment Plan (LCSP), Program Protection Plan (PPP), and other program documentation.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 11.330 | 10.536 | 1.650 | 0.000 | 1.650 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN 0970: *LCAC* | 15.125 | 3.090 | 5.507 | - | 5.507 | 24.190 | 5.795 | 20.881 | 21.301 | 0.000 | 196.193 |
| • SCN 5139: *LCAC SLEP* | 80.738 | 1.774 | 0.000 | - | 0.000 | 23.723 | 0.000 | 0.000 | 0.000 | 0.000 | 1,363.920 |
| • SCN 5100: *LCU 1700* | 34.000 | 34.000 | 31.850 | - | 31.850 | 41.752 | 86.596 | 88.331 | 90.076 | 287.782 | 694.387 |

**Remarks**

**D. Acquisition Strategy**

Technology Transition - RDT&E efforts commenced in FY06. Multiple contracts and Field Activities are involved through FY21 to complete the various projects.

**E. Performance Metrics**

LCAC: Continue to improve the reliability, maintainability, and security of the LCAC.

LCU 1700: Continue risk reduction efforts and complete milestone (MS) documentation in support of a combined MS B/C.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204413N / *Amphibious Tactical Supt Units* | Project (Number/Name)<br>2909 / *Amphibious Lighterage Development* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2909: *Amphibious Lighterage Development* | 0.582 | 0.000 | 3.393 | 2.290 | - | 2.290 | 0.713 | 0.000 | 0.000 | 0.000 | 0.000 | 6.978 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Amphibious Support Craft Vehicle (ASCV) which will be the Lighter Amphibious Resupply Cargo, 5 ton (LARC-V) Replacement, provides amphibious equipment and personnel transport as well as near shore salvage and diving capability. It is a vital piece of equipment required for the execution of the Naval Beach Group (NBG) and Underwater Construction Team (UCT) missions.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** LARC-V Replacement | 0.000 | 3.393 | 2.290 | 0.000 | 2.290 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Conduct scale modeling, prototype development and testing, and prepare draft solicitation package for low rate initial production (LRIP) craft in FY 19. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue prototype development, stability testing, contract scope development and operational assessment of the replacement craft and initiate fabrication of production representative samples. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 3.393 | 2.290 | 0.000 | 2.290 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204413N / *Amphibious Tactical Supt Units* | **Project (Number/Name)**<br>2909 / *Amphibious Lighterage Development* |

**D. Acquisition Strategy**

RDT&E funding is required to develop a replacement amphibious vehicle to support OPLAN and Required Operational Capability/Potential Operating Environment (ROC/POE) requirements of the Naval Beach Groups and Underwater Construction Teams. Technology investigation began in FY15. Requirements documentation and analysis of alternatives and other such efforts are largely being accomplished with in house resources. Design and initial production efforts will be accomplished via a competitive award contract.

**E. Performance Metrics**

Quarterly Program Reviews are conducted with the performer to include funds status discussion, schedule review.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204460M *I (U)Ground/Air Task Oriented Radar (G/ATOR)* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 237.071 | 61.348 | 83.538 | 54.645 | - | 54.645 | 16.406 | 14.607 | 6.700 | 6.832 | Continuing | Continuing |
| 9C89: *Marine Ground-Air Radar* | 237.071 | 61.348 | 83.538 | 54.645 | - | 54.645 | 16.406 | 14.607 | 6.700 | 6.832 | Continuing | Continuing |

**Program MDAP/MAIS Code:**
**Project MDAP/MAIS Code(s):** 386

## A. Mission Description and Budget Item Justification

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and UAS, and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters. G/ATOR enables Integrated Fire Control (IFC) and provides engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume, and precision in the execution of Operational Maneuver From The Sea, allowing Naval forces to project and sustain power deep inland.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 65.598 | 83.538 | 50.274 | - | 50.274 |
| Current President's Budget | 61.348 | 83.538 | 54.645 | - | 54.645 |
| Total Adjustments | -4.250 | 0.000 | 4.371 | - | 4.371 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -2.519 | 0.000 | | | |
| • SBIR/STTR Transfer | -1.731 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 4.259 | - | 4.259 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.112 | - | 0.112 |

**Change Summary Explanation**

RDT&E funding decreases $28.893M throughout the total G/ATOR program from FY17 to FY18 with the completion of GB2 software baseline development, procurement of the majority of test assets and the migration of program management support from RDT&E to PMC funding as G/ATOR moves deeper into the Production and Deployment acquisition phase.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | Project (Number/Name)<br>9C89 / *Marine Ground-Air Radar* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9C89: *Marine Ground-Air Radar* | 237.071 | 61.348 | 83.538 | 54.645 | - | 54.645 | 16.406 | 14.607 | 6.700 | 6.832 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 386

**A. Mission Description and Budget Item Justification**

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and UAS, and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters. G/ATOR enables Integrated Fire Control (IFC) and provides engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume, and precision in the execution of Operational Maneuver From The Sea, allowing Naval forces to project and sustain power deep inland.

RDT&E funding decreases $28.893M throughout the total G/ATOR program from FY17 to FY18 with the completion of GB2 software baseline development, procurement of the majority of test assets and the migration of program management support from RDT&E to PMC funding as G/ATOR moves deeper into the Production and Deployment acquisition phase.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** G/ATOR Contractor Technical, Development Engineering/Block 1 | 12.067 | 18.693 | 16.886 | 0.000 | 16.886 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continue Program Protection planning, EDM-1 Refurbishment, Reliability Improvements, Transition to Production, and Producibility Enhancements in support of GaN Technical Insertion.<br>-Initiated Program Protection efforts. | | | | | |
| ***FY 2017 Plans:***<br>-Continue Program/Technology Protection efforts, Reliability Improvements, Transition to Production, and Producibility Enhancements in support of GaN Technical Insertion.<br>-Complete GaN Transition developmental efforts and EDM-1 Refurbishment. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue Program/Technology Protection efforts, Reliability Improvements, Transition to Production and Producibility Enhancements to include Engineering Change Proposals that address corrective actions during both LRIP and DT1C/OA & DT1D testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** G/ATOR Contractor Technical, Development Engineering/Block 2<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Continued development of G/ATOR Block 2 software.<br>***FY 2017 Plans:***<br>-Complete development of G/ATOR Block 2 software.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 18.488<br>- | 22.355<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** Government Technical Support<br>***Articles:***<br>***Description:*** The Government Technical Support Team provides inherently governmental support functions adding depth, breath and expertise not resident in the G/ATOR Program Office. Functions include technical planning, execution and analysis across multi-disciplinary competencies to include; Systems Architecture, Radar Software Engineering, Radar Systems Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Program Protection, Configuration Management and the coordination necessary to enable a System of Systems interface with other programs in the "Cue to Slew" kill chain to ensure platform/software compatibility. Technical Team support is vital during the G/ATOR LRIP System's Production phase as it is the Government's responsibility to ensure that G/ATOR meets Government Performance Specification Verification.<br>***FY 2016 Accomplishments:*** | 11.892<br>- | 14.100<br>- | 13.751<br>- | 0.000<br>- | 13.751<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued Government support from the following activities to enable program execution: MITRE; NSWC Dahlgren; NSWC Crane; NSWC Pt Hueneme; NAWC-AD China Lake; NSWC Indian Head; NAWCWD Pt Mugu; DTIC; ONR; WNY and TYAD.<br>***FY 2017 Plans:***<br>-Continue Government support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NSWC Pt Hueneme; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu; DTIC and CECOM.<br>***FY 2018 Base Plans:***<br>-Continue Government support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NSWC Pt Hueneme; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu; DTIC and CECOM.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** G/ATOR: Management Services & Travel | 3.531 | 3.250 | 0.766 | 0.000 | 0.766 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued to support engineering, management & logistics program office support and travel in support of system development and Marine User RAM Opportunities.<br>***FY 2017 Plans:***<br>-Continue to support engineering, management & logistics program office support and travel in support of system development and development tests DT1C/DT1D and G/ATOR Block 1 (GB1) OA test.<br>***FY 2018 Base Plans:***<br>-Continue to support engineering, management & logistics program office support and program office travel in support of system development and development tests DT1D/OA and DTIE/IOT&E tests.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** G/ATOR: Test and Evaluation | 15.370 | 25.140 | 23.242 | 0.000 | 23.242 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued planning for G/ATOR Block 1 (GB 1) Developmental Test (DT1C) and Operational Assessment (OA).<br>-Continued participation in WTI/CAC2S in addition to DIVEX events. Includes procurement of ammunition to support DIVEX user events.<br>-Initiated planning for G/ATOR Block 2 (GB 2) Development Test (DT1D) and Operational Assessment (OA).<br>-Initiated procurement of ammunition (Rockets, Mortars and Artillery) to support G/ATOR Block 2 (GB 2) Development Test (DT1D/OA).<br>***FY 2017 Plans:***<br>-Continue preparation for both G/ATOR Block 1 (GB 1) and G/ATOR Block 2 (GB2) Operational Assessment (OA) and DT1E and IOT&E.<br>-Complete planning for both G/ATOR Block 1 (GB 1) Developmental Test (DT1C), and G/ATOR Block 2 (GB 2) Development Test (DT1D).<br>-Initiate both G/ATOR Block 1 (GB 1) Developmental Test (DT1C) and G/ATOR Block 2 (GB 2) Development Test (DT1D).<br>-Complete procurement of ammunition (Rockets, Mortars and Artillery) to support G/ATOR Block 2 (GB 2) Development Test (DT1D/OA).<br>-Initiate procurement of ammunition (Rockets, Mortars and Artillery) to support DT1E/IOT&E<br>-Initiate G/ATOR Block 1 (GB 1) Operational Assessment (OA).<br>***FY 2018 Base Plans:***<br>-Complete G/ATOR Block 1 (GB 1) Operational Assessment (OA), G/ATOR Block 2 (GB 2) Development Test (DT1D/OA) and planning for DT1E/IOT&E.<br>-Complete procurement of ammunition (Rockets, Mortars and Artillery) to support DT1E/IOT&E.<br>-Initiate DT1E/IOT&E<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 61.348 | 83.538 | 54.645 | 0.000 | 54.645 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTE/0604504N/0718: *AIR CONTROL MATCALS* | 1.405 | 0.314 | 11.508 | - | 11.508 | 6.578 | 6.854 | 3.266 | 2.783 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/7000: *INITIAL SPARES-G/ATOR* | 1.572 | 11.193 | 16.640 | - | 16.640 | 13.175 | 13.381 | 13.656 | 13.945 | Continuing | Continuing |
| • PMC/4655: *GRND/AIR TASK ORIENTED RADAR* | 125.597 | 248.258 | 139.167 | - | 139.167 | 220.780 | 270.993 | 248.694 | 218.464 | 91.396 | 1,651.687 |

**Remarks**

**D. Acquisition Strategy**

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems and provides the USMC Air Defense and Air Surveillance (AD/AS) (G/ATOR Block 1), Counterfire/Targeting (G/ATOR Block 2), and Air Traffic Control (G/ATOR Block 4) capability. The AD/AS (GB1) development effort was competitively awarded in 2007 and completed Milestone C in FY14. Development of the Counterfire/Targeting (GB2) capability was initiated in FY10 with a RFI to industry, followed by a Business Case Analysis (BCA) to select the most cost effective procurement strategy. The results of the BCA indicated that a sole source contract to Northrup Grumman Electronic Systems (NGES) was the most cost effective solution. Thus, the GB2 development contract awarded in August FY15.

In FY13, a BCA was performed to determine the optimum strategy for development of the Air Traffic Control (GB4) mission with a developmental contract to be awarded in FY16 per the Navy Air Control (PE 0604504N) budget. Both the AD/AS (GB1) and Air Traffic Control (GB4) capabilities require JROCM mandated Identification Friend or Foe (IFF) enhancements.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G/ATOR BLOCK 1 DEVELOPMENT | C/CPIF | NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD | 156.883 | 12.067 | Dec 2015 | 18.693 | Dec 2016 | 16.886 | Dec 2017 | - | | 16.886 | Continuing | Continuing | Continuing |
| G/ATOR BLOCK 2 SOFTWARE DEVELOPMENT | C/CPFF | NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD | 19.920 | 18.488 | Mar 2016 | 22.355 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 176.803 | 30.555 | | 41.048 | | 16.886 | | - | | 16.886 | - | - | - |

**Remarks**

The funding decreases $24.162M from FY17 to FY18 as GB2 development is completed. Award dates reflected are the actual obligation date for the first incremental award. The Northrop Grumman Product Development contract is incrementally funded throughout the fiscal year.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FFRDC TECHNICAL SUPPORT | FFRDC | MITRE : BOSTON, MA | 3.503 | 0.735 | Dec 2015 | 0.754 | Dec 2016 | 0.726 | Dec 2017 | - | | 0.726 | Continuing | Continuing | Continuing |
| NSWC TECHNICAL SUPPORT | WR | NSWC DAHLGREN : DAHLGREN, VA | 24.884 | 6.637 | Dec 2015 | 6.665 | Dec 2016 | 6.425 | Dec 2017 | - | | 6.425 | Continuing | Continuing | Continuing |
| NSWC TECHNICAL SUPPORT | WR | NSWC CRANE : CRANE, IN | 0.537 | 0.248 | Dec 2015 | 0.264 | Dec 2016 | 0.276 | Dec 2017 | - | | 0.276 | Continuing | Continuing | Continuing |
| NSWC TECHNICAL SUPPORT | WR | NSWC PHD : DAM NECK, VA | 1.511 | 0.759 | Dec 2015 | 0.650 | Dec 2016 | 0.578 | Dec 2017 | - | | 0.578 | Continuing | Continuing | Continuing |
| NAVAIR TECHNICAL SUPPORT | WR | NAWC AD : CHINA LAKE, CA | 0.015 | 0.020 | Jan 2016 | 0.020 | Dec 2016 | 0.020 | Dec 2017 | - | | 0.020 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | Project (Number/Name)<br>9C89 / *Marine Ground-Air Radar* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAVAIR TECHNICAL SUPPORT | WR | NAVAIR : PAX RIVER, MD | 0.000 | 0.000 | | 2.733 | Dec 2016 | 2.761 | Dec 2017 | - | | 2.761 | Continuing | Continuing | Continuing |
| NSWC TECHNICAL SUPPORT | WR | NWSC-IH : INDIAN HEAD, MD | 0.000 | 0.318 | Jan 2016 | 0.305 | Dec 2016 | 0.345 | Dec 2017 | - | | 0.345 | Continuing | Continuing | Continuing |
| AIMS TECHNICAL SUPPORT | WR | AIMS : ROBINS AFB, GA | 0.000 | 0.000 | | 0.250 | Dec 2016 | 0.250 | Dec 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| NAWCWD TECHNICAL SUPPORT | WR | NAWCWD : PT MUGU, CA | 0.000 | 0.212 | Jun 2016 | 0.665 | Dec 2016 | 0.675 | Dec 2017 | - | | 0.675 | Continuing | Continuing | Continuing |
| TYAD TECHNICAL SUPPORT | WR | CECOM : TOBYHANNA, PA | 0.000 | 1.773 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.773 | - |
| DTIC TECHNICAL SUPPORT | WR | DTIC : FT BELVOIR, VA | 0.000 | 0.140 | Mar 2016 | 0.260 | Dec 2016 | 0.280 | Dec 2017 | - | | 0.280 | Continuing | Continuing | Continuing |
| ONR TECHNICAL SUPPORT | WR | ONR : ARLINGTON, VA | 0.000 | 0.935 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.935 | - |
| NAVSEA TECHNICAL SUPPORT | WR | NAVSEA : WAHINGTON NAVY YARD, DC | 0.000 | 0.115 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.115 | - |
| AFATDS TECHNICAL SUPPORT | WR | CECOM : ABERDEEN, MD | 0.000 | 0.000 | | 1.534 | Dec 2016 | 1.415 | Dec 2017 | - | | 1.415 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | N/A : N/A | 1.266 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.266 | - |
| | | **Subtotal** | 31.716 | 11.892 | | 14.100 | | 13.751 | | - | | 13.751 | - | - | - |

**Remarks**

Award dates reflected are the actual obligation date for the first incremental award. Most activities, excluding MITRE are incrementally funded throughout the fiscal year.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRIME CONTRACTOR TEST SUPPORT | C/CPIF | NORTHROP GRUMMAN | 1.561 | 3.581 | Dec 2015 | 3.409 | Dec 2016 | 4.102 | Dec 2017 | - | | 4.102 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | Project (Number/Name)<br>9C89 / *Marine Ground-Air Radar* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD | | | | | | | | | | | | | |
| TEST SUPPORT | WR | NSWC DAHLGREN : DAHLGREN, VA | 0.440 | 1.778 | Dec 2015 | 3.120 | Dec 2016 | 3.416 | Dec 2017 | - | | 3.416 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | MIPR | AMRDEC : REDSTONE ARSENAL, AL | 4.164 | 2.452 | Dec 2015 | 0.310 | Dec 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | MIPR | ARDEC : PICCATINNY, NJ | 0.000 | 0.250 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.250 | - |
| TEST SUPPORT | WR | AC2SN PEO LS : QUANTICO, VA | 0.000 | 1.000 | Feb 2016 | 0.623 | Dec 2016 | 0.595 | Dec 2017 | - | | 0.595 | 0.000 | 2.218 | - |
| TEST SUPPORT | MIPR | JTIC : FT HUACHUCA, AZ | 0.148 | 0.100 | Dec 2015 | 0.062 | Dec 2016 | 0.117 | Dec 2017 | - | | 0.117 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | Various | NSWC-FALLBROOK : CRANE, IN | 3.184 | 1.233 | Dec 2015 | 2.692 | Dec 2016 | 2.884 | Dec 2017 | - | | 2.884 | Continuing | Continuing | Continuing |
| TEST EVALUATION SUPPORT | C/CPIF | MCOTEA : QUANTICO, VA | 1.880 | 0.000 | | 0.080 | Apr 2017 | 0.107 | Dec 2017 | - | | 0.107 | Continuing | Continuing | Continuing |
| TEST SUPPORT | Various | NSWC CORONA : CORONA, CA | 1.490 | 0.812 | Dec 2015 | 1.456 | Dec 2016 | 1.540 | Dec 2017 | - | | 1.540 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | Various | NSWC PHD : DAM NECK, VA | 3.455 | 1.380 | Dec 2015 | 1.897 | Dec 2016 | 1.926 | Dec 2017 | - | | 1.926 | Continuing | Continuing | Continuing |
| TEST ASSET PROCUREMENT | C/CPFF | MCSC : QUANTICO, VA | 1.344 | 1.325 | Dec 2015 | 9.221 | Dec 2016 | 1.019 | Dec 2017 | - | | 1.019 | 0.000 | 12.909 | - |
| TEST ASSET PROCUREMENT | MIPR | PEO AMMO : PICATINNY, NJ | 0.000 | 0.859 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.859 | - |
| TEST PLANNING/ SUPPORT | WR | JSF PMO : WASHINGTON , DC | 0.000 | 0.000 | | 0.000 | | 0.770 | Dec 2017 | - | | 0.770 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | WR | NAWCWD : PT MUGU, CA | 0.000 | 0.000 | | 0.000 | | 0.343 | Dec 2017 | - | | 0.343 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | Project (Number/Name)<br>9C89 / *Marine Ground-Air Radar* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TEST PLANNING/ SUPPORT | WR | NAVSEA/PMR-51 : WASHINGTON, DC | 0.000 | 0.000 | | 0.000 | | 0.540 | Dec 2017 | - | | 0.540 | Continuing | Continuing | Continuing |
| TEST PLANNING/ SUPPORT | WR | NAVAIR : PAX RIVER, MD | 0.000 | 0.000 | | 0.000 | | 0.766 | Dec 2017 | - | | 0.766 | Continuing | Continuing | Continuing |
| TEST OPERATOR SUPPORT | Various | MARFOR : Various | 0.893 | 0.049 | Dec 2015 | 0.240 | Dec 2016 | 0.250 | Dec 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| TEST RANGE SUPPORT | WR | YPG : YUMA, AZ | 0.000 | 0.551 | Jun 2016 | 0.440 | Dec 2016 | 1.390 | Dec 2017 | - | | 1.390 | Continuing | Continuing | Continuing |
| TEST RANGE SUPPORT | WR | NAWCWD : PT MUGU, CA | 0.000 | 0.000 | | 0.000 | | 1.765 | Dec 2017 | - | | 1.765 | Continuing | Continuing | Continuing |
| TEST FACILITY SUPPORT | WR | SCSC : WALLOPS IS, MD | 0.000 | 0.000 | | 0.465 | May 2017 | 0.372 | Dec 2017 | - | | 0.372 | Continuing | Continuing | Continuing |
| TEST FACILITY SUPPORT | WR | MCAS YUMA : YUMA, AZ | 0.000 | 0.000 | | 0.810 | May 2017 | 0.825 | Dec 2017 | - | | 0.825 | 0.000 | 1.635 | - |
| TEST FACILITY SUPPORT | WR | MCAS CPNC : ATLANTIC FIELD, NC | 0.000 | 0.000 | | 0.315 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.315 | - |
| TEST FACILITY SUPPORT | WR | MCB 29 PALMS : 29 PALMS, CA | 0.000 | 0.000 | | 0.000 | | 0.515 | Dec 2017 | - | | 0.515 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | N/A : N/A | 4.272 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.272 | - |
| | | **Subtotal** | 22.831 | 15.370 | | 25.140 | | 23.242 | | - | | 23.242 | - | - | - |

**Remarks**

Overall, the funding decrease of $1.898M is due to the majority of the test assets being ordered in FY17 to support both DT1D/OA test in late FY17/FY18 and DT1E/IOT&E test in mid-FY18/early FY19. Increase in FY18 efforts for both Prime Contractor Test Support ($0.693M) and for test range support at YPG, Yuma AZ ($0.950M), Pt. Mugu, CA ($1.765M) and 29 Palms, CA ($0.515M) are required to support both DT1D/OA & DT1E/IOT&E testing. Program technical supports increases for both NSWC-DD ($0.296M) and NSWC-Fallbrook ($0.192M) are necessary to support DT1D and DT1E/OA testing that was previously being supported by AMRDEC and ARDEC. Additionally, increases for new support activities and test ranges in FY18 also help support meeting DOT&E required testing of Signature Controlled Targets above the collateral classification of the G/ATOR system.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MANAGEMENT SERVICES | C/FP | MCSC : MCSC - QUANTICO, VA | 4.871 | 3.256 | Nov 2015 | 2.950 | Nov 2016 | 0.471 | Nov 2017 | - | | 0.471 | Continuing | Continuing | Continuing |
| TRAVEL | Various | MCSC : QUANTICO, VA | 0.850 | 0.275 | Sep 2016 | 0.300 | Sep 2017 | 0.295 | Sep 2018 | - | | 0.295 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.721 | 3.531 | | 3.250 | | 0.766 | | - | | 0.766 | - | - | - |

**Remarks**

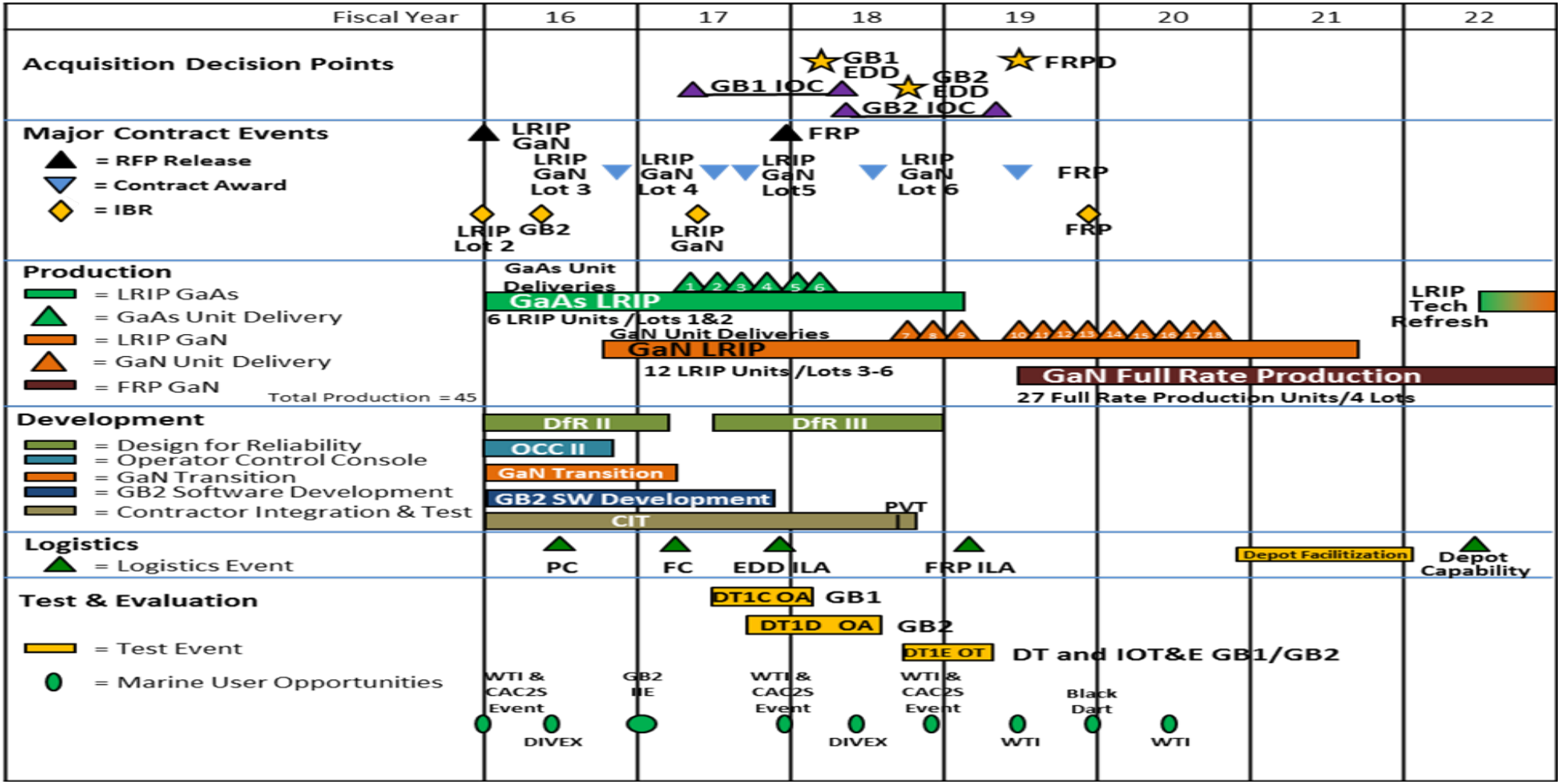
The funding decreases of $2.484M from FY17 to FY18 with the migration of $2.479M program management support from RDT&E to PMC funding as G/ATOR moves deeper into the Production and Deployment acquisition phase. Award dates reflected are the actual obligation date for the first incremental award. Each activity is incrementally funded throughout the fiscal year.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 237.071 | 61.348 | | 83.538 | | 54.645 | | - | | 54.645 | - | - | - |

**Remarks**

The funding decreases of $28.893M from FY17 to FY18 with the completion of GB2 development, procurement of the majority of test assets and the continued movement of program management support from RDT&E to PMC funding as G/ATOR moves deeper into the Production and Deployment acquisition phase.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 9C89*** | | | | |
| Gallium Arsenide (GaAs) Radar: GB1 Developmental Test (DT1C) | 3 | 2017 | 4 | 2017 |
| Gallium Arsenide (GaAs) Radar: GB1 Operational Assessment (OA) | 4 | 2017 | 1 | 2018 |
| Gallium Arsenide (GaAs) Radar: GB1 Radar IOC | 2 | 2017 | 2 | 2018 |
| Gallium Arsenide (GaAs) Radar: LRIP Tech Refresh | 3 | 2022 | 4 | 2022 |
| Gallium Nitride (GaN) Radar: LRIP Lot 3 Contract Award | 4 | 2016 | 4 | 2016 |
| Gallium Nitride (GaN) Radar: GaN Transition | 1 | 2016 | 1 | 2017 |
| Gallium Nitride (GaN) Radar: LRIP Lot 4 Contract Award | 2 | 2017 | 2 | 2017 |
| Gallium Nitride (GaN) Radar: GB1/GB2 Developmental Test (DT1E) | 3 | 2018 | 1 | 2019 |
| Gallium Nitride (GaN) Radar: GaN PVT | 4 | 2018 | 4 | 2018 |
| Gallium Nitride (GaN) Radar: GB1/GB2 IOTE | 1 | 2019 | 2 | 2019 |
| Gallium Nitride (GaN) Radar: LRIP Lot 5 Contract Award | 3 | 2017 | 3 | 2017 |
| Gallium Nitride (GaN) Radar: LRIP Lot 6 Contract Award | 2 | 2018 | 2 | 2018 |
| Gallium Nitride (GaN) Radar: FRPD | 3 | 2019 | 3 | 2019 |
| Gallium Nitride (GaN) Radar: FRP | 3 | 2019 | 4 | 2022 |
| Gallium Nitride (GaN) Radar: LRIP Tech Refresh | 3 | 2022 | 4 | 2022 |
| Ground Weapons Locating Radar (GWLR): GB2 Software Development | 1 | 2016 | 4 | 2017 |
| Ground Weapons Locating Radar (GWLR): GB2 Developmental Test (DT1D) | 4 | 2017 | 1 | 2018 |
| Ground Weapons Locating Radar (GWLR): GB2 Operatonal Assessment (OA) | 2 | 2018 | 3 | 2018 |
| Ground Weapons Locating Radar (GWLR): GB2 IOC | 2 | 2018 | 2 | 2019 |
| Logistics: EDD ILA | 4 | 2017 | 4 | 2017 |
| Logistics: FRP ILA | 1 | 2019 | 1 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)* | **Project (Number/Name)**<br>9C89 / *Marine Ground-Air Radar* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Logistics: Depot Facilitzation | 4 | 2020 | 1 | 2022 |
| Logistics: Depot Capability | 2 | 2022 | 2 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204571N *I Consolidated Trng Sys Dev* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 372.916 | 32.902 | 38.593 | 66.518 | - | 66.518 | 78.419 | 57.565 | 25.556 | 20.610 | Continuing | Continuing |
| 0604: *Training Range & Instr Dev* | 145.085 | 3.435 | 3.310 | 0.003 | - | 0.003 | 3.755 | 5.110 | 3.632 | 3.709 | Continuing | Continuing |
| 1427: *Surface Tactical Team Trainer (STTT)* | 97.223 | 9.857 | 12.289 | 15.274 | - | 15.274 | 15.387 | 15.454 | 13.541 | 11.153 | Continuing | Continuing |
| 2124: *Air Warfare Training* | 45.852 | 2.226 | 1.462 | 1.585 | - | 1.585 | 1.733 | 1.741 | 1.663 | 1.697 | Continuing | Continuing |
| 3093: *TACTS/LATR Replacement* | 68.450 | 12.676 | 14.962 | 48.473 | - | 48.473 | 57.544 | 35.260 | 6.720 | 4.051 | Continuing | Continuing |
| 3356: *High Fidelity Surface Trainers* | 16.306 | 4.708 | 6.570 | 1.183 | - | 1.183 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 28.767 |

**A. Mission Description and Budget Item Justification**

0604 - Training Range and Instrumentation Development project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: the Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR rotary platform technology improvements and the Radiant Mercury Cross Domain Solution.

1427 - Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system. This is required to maintain capabilities and interfaces to provide realistic combat system coordinated team, unit and Fleet Synthetic Training (FST) collective Group/Force level training events. In addition, BFTT supports the embedded trainer "family of systems" approach for the development of a Total Ship Training Capability (TSTC). Specific improvements include improved integration with the Navy Continuous Training Environment (NCTE) and development of a High Level Architecture (HLA) capable, integrated shipboard network to meet increasing Commander Naval Surface Forces (CNSF) and United States Fleet Forces Command (USFFC) FST requirements. The need for transforming training is documented within the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

2124 - Air Warfare Training Development (AWTD) provides for risk mitigation and next generation platform, Unmanned Aerial Systems (UAS), Live Virtual Constructive (LVC) and associated visualization component development for distributed mission training, and for stand-alone and small footprint deployable devices. Support the Navy Aviation Simulation Master Plan (NASMP) upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Provide for Open Architecture (OA), and common systems interface applications. Assess trainee cognitive requirements and the development and incorporation of next generation LVC, UAS constructive and associated visualization component technologies. Additionally, AWTD provides for advanced virtual component fidelity improvements for LVC capability which includes the "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter enabling technologies.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204571N *I Consolidated Trng Sys Dev* |

LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea Battle Space and Naval Integrated Fire Control-Counter Air capabilities development.

3093: The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground datalink, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Inc II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. FY18 represents a full year of engineering, manufacturing and development (EMD) for the program, which justifies the current control. The program's Preliminary Design Review (PDR) and Critical Design Review (CDR) will be completed in FY18. Both are major required Systems Engineering Technical Review (SETR) events and MDA/ASN(RD&A) knowledge points. FY18 funding will complete tasking necessary to prepare for Engineering Development Model (EDM) fabrication to begin in 1Q FY19. This schedule is necessary to support the MS C timeline and to meet the Fleet IOC need date of 2Q FY22 in order to address critical OPSEC concerns.

3356- Funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers for all Advanced Capability Build (ACB) and below Aegis baselines. This line also provides funds for the research and development of advanced technologies to support BMD 5.XX and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent.

JUSTIFICATON FOR BUDGET ACTIVITY:
This program is funded under Operational Systems Development because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 34.325 | 38.593 | 41.924 | - | 41.924 |
| Current President's Budget | 32.902 | 38.593 | 66.518 | - | 66.518 |
| Total Adjustments | -1.423 | 0.000 | 24.594 | - | 24.594 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.745 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.678 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 24.457 | - | 24.457 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.137 | - | 0.137 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204571N *I Consolidated Trng Sys Dev* |

**Change Summary Explanation**

The FY 2018 funding request was also reduced by $3.946 million to account for the availability of prior year execution balances.

0604: FY18 reduced $3.946M due to Program Element (PE) prior year under execution. Scheduled 6.2 upgrade for FY18 have been changed to FY19. 6.6 upgrade removed from schedule to be planned for FY23. TTR 2018.1 and 2018.2 upgrade removed from system Development and Delivery schedule. Next Gen Phase 3 changed from FY18 to FY19, and Next Gen Phase 7 removed from current schedule, to be planned for System development and Delivery for FY23.

3093: Cost growth in FY18 from previous submission due to revised government Life Cycle Cost Estimate (LCCE). The revised LCCE supports the contract awarded in March 2017. Areas of cost growth include increased hardware development costs based on adjustments to the ground station necessary to account for a shipboard variant; additional Software Lines of Code (SLOC) due to implementation of an open systems architecture and limitations on reuse of legacy proprietary software code, and an increase due to systems engineering/ program management (SEPM) labor costs required to mature and integrate system components. Cost growth funded via prioritization within aviation training and range programs.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>0604 / *Training Range & Instr Dev* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0604: *Training Range & Instr Dev* | 145.085 | 3.435 | 3.310 | 0.003 | - | 0.003 | 3.755 | 5.110 | 3.632 | 3.709 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), Electronic Warfare (EW) server, Link 16 interface, TTR rotary platform technology improvements and the Cross Domain Solutions (CDS).

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** LATR | 1.250 | 2.515 | 0.003 | 0.000 | 0.003 |
| ***Articles:*** | - | - | - | - | - |

***Description:*** Design, integrate and test modules to eliminate obsolete components in the LATR Pod. Design, integrate and test LATR software baseline upgrades. Design, integrate and test Participant Instrumentation Packages (PIP) modules to address obsolescence, high failure components and to improve operability and performance. Conduct and complete installation of the Ground System Rehosts. Conduct and complete security testing and assessment for LATR system certification and accreditation for Ground System Rehosts. Develop, test and integrate software and hardware modifications to system test sets. Develop, test and integrate LATR data translators. Conduct studies to identify sub-projects required through FY22. Complete ground system and PIP refresh sub-projects, in conjuction with, semi-annual system block upgrades. Conduct LATR Operational Security (OPSEC) Posture Improvements Sub-Project, Shipboard and Rotary Wing Technology Wing Upgrade (LSRTU) and LATR Navigation Technology Refresh (LNTR).

***FY 2016 Accomplishments:***

Develop and test LATR ground software version 6.0.0. Finalize LATR Shipboard and Rotary Wing Technology Upgrade (LSRTU) development, including Physical Configuration Audit, System Verification Review, Production Readiness Review and Developmental Test events in advance of Milestone C.

***FY 2017 Plans:***

Develop and test LATR ground Software version 6.1.0. Continue to develop operational system improvements and solutions to eliminate LATR obsolescence issues.

***FY 2018 Base Plans:***

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>0604 / *Training Range & Instr Dev* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue to develop operational system improvements and solutions to eliminate LATR Obsolescence issues.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TTR | 1.980 | 0.554 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop and test upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server. Develop and test upgrades to the Link-16 Interface, JDS, RADS, and EW server.<br>***FY 2016 Accomplishments:***<br>Develop and test 2016.1 & 2016.2 upgrades to the JDS, RADS & EW Server. With the exception of FY 15, TTR fields two software block upgrades per year to allow the JDS, EW Server, and RADS to remain in concert with evolving threat and tactical training requirements.<br>***FY 2017 Plans:***<br>Develop and test 2017.1 & 2017.2 upgrades to the JDS, RADS & EW Server to remain in concert with evolving threat and tactical training requirements. Develop operational systems improvements to the Rotary Wing Tracking System.<br>***FY 2018 Base Plans:***<br>Funds for FY18 have been eliminated.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Ocean Systems | 0.205 | 0.241 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Research, develop, and test technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges.<br>***FY 2016 Accomplishments:***<br>Conduct analysis of advanced technical solutions for Anti-Submarine Warfare (ASW) range capability at Pacific Missle Range Facility (PMRF), Barking Sands, Hawaii and future ocean range locations.<br>***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>0604 / *Training Range & Instr Dev* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Conduct analysis of advanced technical solutions for ASW range capability at Pacific Missile Range Facility (PMRF), Barking Sands, Hawaii and future ocean range locations. Research and investigate environmental parameters to support future project planning, and design fixed/portable range Concept of Operations (CONOPs).<br>***FY 2018 Base Plans:***<br>Funds for FY18 have been eliminated.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.435 | 3.310 | 0.003 | 0.000 | 0.003 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/4204: *Weapons Range Support Equipment (WRSE)/ LSRTU/Ocean Systems* | 3.709 | 0.500 | 15.708 | - | 15.708 | 13.373 | 19.013 | 5.815 | 4.325 | 0.000 | 62.443 |

**Remarks**

Related OPN cost codes include SCO12 Ocean Systems, SC034 LATR Shipboard Rotary Technology Upgrade, SC132 LNTR, and associated support elements (e.g. relevant portions of SC831 Production Engineering). Increase from PB17 to current submission reflects increase in OPN 4204 for procurement of LNTR and Portable Underwater Training Range (PUTR).

**D. Acquisition Strategy**

The Training Range and Instrumentation Development (TRID) program is a non-ACAT program. The integrated program teams that develop new TRID capabilities include government and contractor engineering personnel.

**E. Performance Metrics**

Metric/Description:
Naval Air Warfare Center-Aircraft Division (NAWC-AD): # of Large Area Tracking Range (LATR) system product improvements and new capabilities. Successful application of system engineering processes. Design and development of improvements. Site acceptance of product improvements with no Priority 1 or 2 problem reports. Completion of 1 upgrade per year.

Jacobs Eng: # of Large Area Tracking Range (LATR) system product improvements and new capabilities. Successful design, development and testing of product improvements and new capabilities. Site acceptance of product improvements with no Priority 1 or 2 problem reports.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>0604 / *Training Range & Instr Dev* |

Naval Air Warfare Center Weapons Division(NAWC-WD): # of Tactical Training range (TTR) upgrades per year. Successful application of system engineering processes. Design and development of improvements. Site acceptance of product improvements with no Priority 1 or 2 problem reports. Completion of 2 upgrade per year.

Jacobs Eng: # of TTR system product improvements and new capabilities. Successful design, development, and testing of product improvements and new capabilities. Site acceptance of product improvements with no Priority 1 or 2 problem reports.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>1427 / *Surface Tactical Team Trainer (STTT)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1427: *Surface Tactical Team Trainer (STTT)* | 97.223 | 9.857 | 12.289 | 15.274 | - | 15.274 | 15.387 | 15.454 | 13.541 | 11.153 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Surface Tactical Team Trainer project/BFTT Program provides enhancements and upgrades to the Total Ship Training Capability (TSTC) training components to support AEGIS and Ship Self Defense System (SSDS) needs for increased training capability and functionality during Fleet Synthetic Training (FST)/Live Virtual Constructive (LVC) events. The BFTT component develops new capabilities and integrates training capabilities developed by the AEGIS and SSDS TSTC into a consolidated integrated training system for use on AEGIS and SSDS ships. TSTC enhancements developed address current and future training requirements to align with the Combat System new and improved capabilities by implementing new functionality and by integrating capabilities being developed by both the AEGIS and SSDS Training Improvement Programs into a consolidated training system. TSTC developments and upgrades include the evolution to an open distributed architecture with maximum commonality across ship classes, integrating existing training systems, or leveraging capabilities developed by other programs.

TSTC provides realistic joint warfare training across the spectrum of armed conflict, realistic unit level team training in all warfare areas (e.g. NIFC-CA and BMD missions to support IAMD). TSTC provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system level team training as an integral part of the Afloat Training Organization, the Tactical Training Groups and C2F/C3F FST/LVC events.

Develop and integrate commensurate training improvements to SSDS ACB 20 for Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

TSTC integrated on SSDS provides the capability to complete system and operational level testing of the combat system.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Surface Tactical Team Trainer (STTT) | 9.857 | 12.289 | 15.274 | 0.000 | 15.274 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed Build 5.0 testing and Combat System Certification to support SLQ-32 (V)6 SEWIP BLK II integration in AEGIS Baseline 9A.0/9.C1 and legacy AWS Baseline ships. Continued development of TSTC which include BFTT Build 5.1, Advanced Training Domain (ATD) 1.0, Dual Band Radar Simulator, CEC Enhanced and Interim Training Capabilities, and Identification Friend/Foe Simulator. Completed BFTT 5.1 Critical Design Review and Test Readiness Review milestone events. BFTT 5.1 is planned to be integrated onto CVN-78, and AEGIS BL 9.C2 phases 0 and 1. Completed ATD 1.0 Systems Requirement Review, In-Process Review and System | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>1427 / *Surface Tactical Team Trainer (STTT)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Functional Review milestones. ATD is planned to be integration onto CVN-73 and AEGIS BL 9.C2 phase 2 TI-16 based combat systems. Completed development and integration of the Dual Band Radar simulator that is a key enabler for CVN-78 embedded training. Completed BFTT 5.1 developer integration testing on SSDS ACB 12+ with CVN-78.<br>Continued Combat Systems level Integration engineering for Cooperative Engagement Capability (CEC) Enhanced Trainer (CET) training capabilities and commensurate updates to Cooperative Engagement Processor computer program.<br>Began requirements development of AEGIS and SSDS ACB 20 TSTC training requirements, to include updates to naval capabilities documents, combat systems level requirement specifications, and interface requirements of the Air and Missile Defense Radar (AMDR) stimulation capability. Initiated development of NULKA simulation capability to enable combat systems soft kill training. | | | | | |
| ***FY 2017 Plans:***<br>Perform BFTT 5.1 element certification, conduct combat system test and evaluation, and deliver BFTT Build 5.1. Conduct ATD 1.0 preliminary design review and critical design reviews. Complete Build 5.1 testing and Certification for CVN-78 and AEGIS Baselines 9.A0/9.C1/9.C2. Deliver and Install BFTT 5.1 to support CVN78 SSDS MK2 Mod 6C engineering tests at Wallops Island and Shipboard Combat System light off event. Complete ATD 1.0 CDR. Initiate software development for ATD 1.0 and necessary integration engineering to support Aegis Baseline 9.C2 TSTC development. Conduct BFTT 5.1 element certification for AEGIS ACB 16 Phase 0, and SSDS CVN-78 and CVN-72 configurations.<br>Complete development and deliver CEC Interim Training Capability to enable single and multi-ship integrated fire control training and continue development of embedded CEC training capability. Conduct NULKA and IFF simulation capability preliminary and critical design reviews. Continue development of embedded shipboard MH-60R Simulator and associated components.<br>Initiate development of requirements to support TSTC capability improvements to support tactical training requirements of AEGIS and SSDS ACB 20, to include training system modifications to support integration of the Air and Missile Defense Radar (AMDR) stimulation capability, Enhanced Sea Sparrow Missile System, and Advanced Electronic Warfare. | | | | | |
| ***FY 2018 Base Plans:***<br>Conduct ATD 1.0 Test and Evaluation in support of AEGIS ACB 16 phase 2 and SSDS ACB 12+ TI-16 based combat systems.<br>Deliver CEC Embedded Training capability, IFF Simulator, NULKA Simulator, and MH-60R Simulator for integration and testing. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>1427 / *Surface Tactical Team Trainer (STTT)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Develop tactical representative training improvements to SSDS ACB 20 by developing Own-Ship Weapon Simulation based on ESSM BLK 2 models, and implement Electronic Warfare Training improvements based on SEWIP BLK 3 capabilities. Capabilities developed will be leveraged to enhance AEGIS as appropriate.<br>Begin TSTC requirements developments of AMDR, ESSM and Advanced EW training capabilities.<br>Begin TSTC requirements development for the DDG 1000 embedded shipboard training capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 9.857 | 12.289 | 15.274 | 0.000 | 15.274 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2762/MB040/MB5IN: *Other Training Equipment (Surface BFTT/TSTC portion only)* | 27.816 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 192.763 |
| • RDTE/0604307N/3357: *Aegis Training Improvement Program* | 14.624 | 10.458 | 7.787 | - | 7.787 | 6.531 | 5.047 | 5.162 | 5.266 | Continuing | Continuing |
| • RDTE/0604755N/3358: *SSDS Training Improvement Program* | 3.074 | 2.864 | 7.593 | - | 7.593 | 7.495 | 7.520 | 8.889 | 9.067 | Continuing | Continuing |
| • OPN/5664/TBD: *Other Training Equipment (Surface BFTT/TSTC portion only) New BLI FY17* | 0.000 | 26.151 | 31.988 | - | 31.988 | 29.333 | 29.394 | 29.313 | 29.595 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The BFTT acquisition strategy for system development utilizes the Advanced Capability Build (ACB) development model, as mandated by OPNAV. Incremental acquisition and fielding, utilizing commercial off-the-shelf technology to the extent possible, is in accordance with OPNAV LTR Ser N86/9U179029 dtd 31 Jul 09.

**E. Performance Metrics**

TSTC BFTT Core component will be developed to meet the following developmental milestones. These milestones are in close alignment with AEGIS BL9.C2 and SSDS MK 2 development milestones and integration events. (see R-4)

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>1427 / *Surface Tactical Team Trainer (STTT)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Development | C/FFP | GTS : Virginia Beach, VA | 14.592 | 0.368 | Dec 2015 | 0.497 | Dec 2016 | 0.571 | Dec 2017 | - | | 0.571 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | SEA02/NSWC Dam Neck/NSWC Dahlgren : NAVSEA/ Dam Neck/NSWC Dahlgren | 22.283 | 3.889 | Dec 2015 | 3.799 | Dec 2016 | 5.824 | Dec 2017 | - | | 5.824 | 0.000 | 35.795 | - |
| | | **Subtotal** | 36.875 | 4.257 | | 4.296 | | 6.395 | | - | | 6.395 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development | WR | NSWC Dam Neck/ SEA 02 : WR/REQN | 39.677 | 2.368 | Dec 2015 | 4.803 | Dec 2016 | 5.671 | Dec 2017 | - | | 5.671 | 0.000 | 52.519 | - |
| | | **Subtotal** | 39.677 | 2.368 | | 4.803 | | 5.671 | | - | | 5.671 | 0.000 | 52.519 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NSWC Dam Neck/ SEA 02 : WR/REQN | 11.231 | 2.429 | Dec 2015 | 1.957 | Dec 2016 | 1.767 | Dec 2017 | - | | 1.767 | 0.000 | 17.384 | - |
| | | **Subtotal** | 11.231 | 2.429 | | 1.957 | | 1.767 | | - | | 1.767 | 0.000 | 17.384 | - |

**Management Services ($ in Millions)**

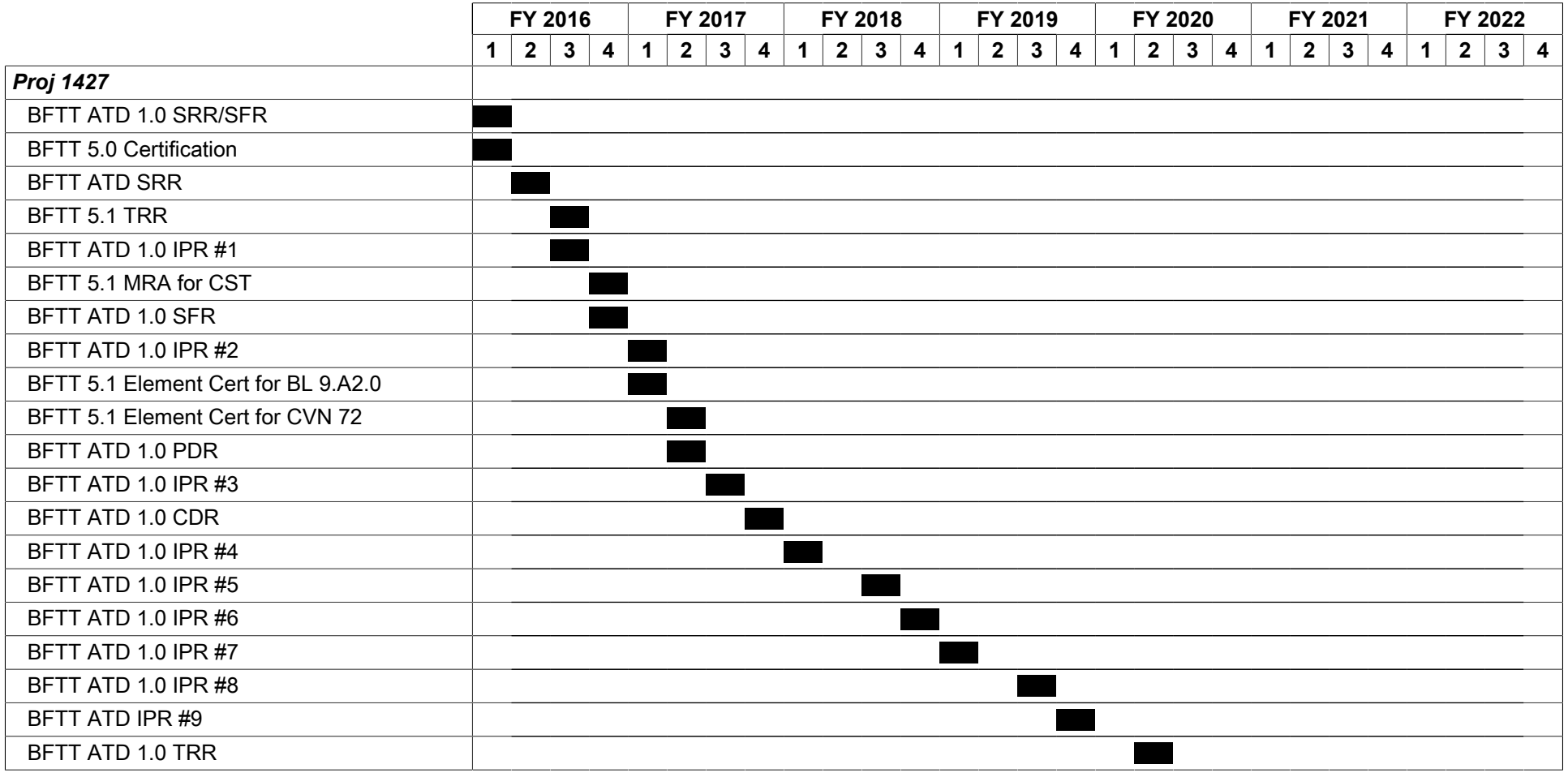
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Engineering Support | WR | NSWC Dam Neck/ SEA02 : WR/REQN | 9.440 | 0.803 | Dec 2015 | 1.233 | Dec 2016 | 1.441 | Dec 2017 | - | | 1.441 | 0.000 | 12.917 | - |
| | | **Subtotal** | 9.440 | 0.803 | | 1.233 | | 1.441 | | - | | 1.441 | 0.000 | 12.917 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>1427 / *Surface Tactical Team Trainer (STTT)* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 97.223 | 9.857 | | 12.289 | | 15.274 | | - | | 15.274 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>1427 / *Surface Tactical Team Trainer (STTT)* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>1427 / *Surface Tactical Team Trainer (STTT)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 1427*** | | | | |
| BFTT ATD 1.0 SRR/SFR | 1 | 2016 | 1 | 2016 |
| BFTT 5.0 Certification | 1 | 2016 | 1 | 2016 |
| BFTT ATD SRR | 2 | 2016 | 2 | 2016 |
| BFTT 5.1 TRR | 3 | 2016 | 3 | 2016 |
| BFTT ATD 1.0 IPR #1 | 3 | 2016 | 3 | 2016 |
| BFTT 5.1 MRA for CST | 4 | 2016 | 4 | 2016 |
| BFTT ATD 1.0 SFR | 4 | 2016 | 4 | 2016 |
| BFTT ATD 1.0 IPR #2 | 1 | 2017 | 1 | 2017 |
| BFTT 5.1 Element Cert for BL 9.A2.0 | 1 | 2017 | 1 | 2017 |
| BFTT 5.1 Element Cert for CVN 72 | 2 | 2017 | 2 | 2017 |
| BFTT ATD 1.0 PDR | 2 | 2017 | 2 | 2017 |
| BFTT ATD 1.0 IPR #3 | 3 | 2017 | 3 | 2017 |
| BFTT ATD 1.0 CDR | 4 | 2017 | 4 | 2017 |
| BFTT ATD 1.0 IPR #4 | 1 | 2018 | 1 | 2018 |
| BFTT ATD 1.0 IPR #5 | 3 | 2018 | 3 | 2018 |
| BFTT ATD 1.0 IPR #6 | 4 | 2018 | 4 | 2018 |
| BFTT ATD 1.0 IPR #7 | 1 | 2019 | 1 | 2019 |
| BFTT ATD 1.0 IPR #8 | 3 | 2019 | 3 | 2019 |
| BFTT ATD IPR #9 | 4 | 2019 | 4 | 2019 |
| BFTT ATD 1.0 TRR | 2 | 2020 | 2 | 2020 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>2124 / *Air Warfare Training* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2124: *Air Warfare Training* | 45.852 | 2.226 | 1.462 | 1.585 | - | 1.585 | 1.733 | 1.741 | 1.663 | 1.697 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project transitions new training and range system technologies for use in Naval Aviation training. Products from this effort are directly tied to the Navy Aviation Simulation Master Plan (NASMP), MH-60R/S master plan, Unmanned Aerial Systems (UAS) master plan, the Live Virtual Constructive (LVC) program, component technologies, including the Multiplex Data Bus Controller Translator Transmitter, F/A-18C-F Requirements Procurement Plan (RPP), open architecture implementation, multiple technology refresh efforts and the Multi-Mission Maritime Aircraft/P-8 programs. These efforts will support training optimization of future naval aviation training/preview/mission rehearsal systems (fixed, deployed, and unmanned). Tasks include: specification development to provide for common, modular, High Level Architecture compliant, high fidelity Distributed Mission Training and mission rehearsal capabilites ashore and afloat. Technologies to be developed and integrated include: intelligent semi-automated forces (SAF) technologies, automated performance measurement technology, advanced net-ready weapons simulation, Air to Air/ Air to Ground, visual/sensor enhancement, sensor/weather server, common post mission assessment technologies, tablet mission preview technology, advanced visual-sensor technology, high resolution helmet mounted, and/or flat panel displays, 20-20 visual acuity image generation, NAVAIR Portable Source Initiative improvements, common correlated data set technologies, common link, common software/database reuse technologies, advanced environmental effects modeling, fused radar/infra-red/electro-optic and acoustic sensor simulations, aerodynamic modeling, physics-based infra-red simulations, spatial disorientation research, comms degradation modeling, and final Test and Evaluation (T&E) within the Aviation Training Technology Integration Facility (ATTIF), Naval Air Warfare Center-Aircraft Division. This Manned-Flight Simulator (MFS) ATTIF capability provides a window to fleet aviators for critical comment, evaluation and fine tuning of new, interoperable, and innovative technologies such as LVC before final transition to the fleet. Naval Aviation Distributed Training Center, debrief/After Action Review (AAR), and intelligent training tools for the virtual environment are focused on human performance and trend analysis enhancements for fleet readiness and distributed mission training at all levels.

Metrics: These technology transitions seek to lower Total Ownership Costs of the training systems and life cycle costs, including: increasing software re-use, reduced instructor manning profiles, software-based fidelity enhancements and increased fleet readiness by enhancing overall system fidelity to the projected operating environments. NASMP readiness improvements are conservatively forecasted at 12-35% Training and Readiness improvement via synthetic environment upgrades and associated technology upgrades to stand-alone and networked simulators. Individual technology transition investments have routinely exceeded 300+% financial Return On Investment. Technology Readiness Levels, Training and Readiness, fleet readiness, and financial metrics are used.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** HUMAN/INSTRUCTIONAL SYSTEMS INTEGRATION | 1.385 | 0.670 | 0.732 | 0.000 | 0.732 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop common AAR and platform-unique post mission assessment, Intelligent Tactical SAF, and high fidelity simulator component technologies. AAR, and high fidelity components such as Intelligent SAF designs lower NASMP upgrade and simulator life-cycle costs. Integrate Voice-Capable SAF component | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>2124 / *Air Warfare Training* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| technologies, improve open common instructor interface effectiveness and provide for multi-SAF exercise utilization. Analyze, develop, and integrate common architecture components for F/A-18C-F, EA-18G, MH-60R/S, Unmanned Aerial Systems (UAS) platforms, E-2C/D & USMC mission areas, intelligent instructor operator components, automated performance measurement technologies, Tactical Aircraft/ Multi-Mission Maritime Aircraft/ Reduced Oxygen Breathing Device-Spatial Disorientation technologies/devices common graphic user interface initiatives, common threat system formats, Next Generation Threat System (NGTS) technology transitions, Joint Semi-Automated Forced (JSAF) compatibility, cross platform post mission performance measurement, Multi-purpose Reconfigurable Maintenance Training Systems, (MRTS) and after action review/debrief innovations, thereby maximizing return on investment for instructional systems technology investments. | | | | | |
| ***FY 2016 Accomplishments:***<br>Provide continued support to the NAMRU research team to complete both Reduced Oxygen Breathing Device/Hypoxia system configuration, test and evaluation, and final prototyping development/support for the Spatial Disorientation family of systems to meet new curricula and requirements. Provide training station/instructional systems support for standard post-mission assessment software, tactical trend analysis and Common Simulation Product development. | | | | | |
| ***FY 2017 Plans:***<br>Continue planned fidelity improvements for Next Generation Threat System (NGTS), including tactical behaviors and rapid scenario development using both actual operational behaviors and simulated recordings for "Patterns-of-life" white shipping, and other large entity sets with realistic behaviors. Continue development of Post Mission Assessment for Tactical Training (PMATT), Maritime, fixed and rotary wing, and investigate similar applications for cross-platform distributed training applications. Perform Advanced Development Simulation (ADS) component enhancements, and Technology Readiness Assessments (TRA) in relevant environments. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue fidelity improvements for synthetic entity systems (e.g. NGTS, JSAF), including realistic blue force collaborative behavior and improved support for debrief in distributed training environments. Support test and evaluation of alternate solutions for mask-on hypoxia training. Continue Post Mission Assessment for Tactical Training (PMATT) with emphasis on automated scoring of live training events in fixed and rotary wing aircraft. Investigate strategies for efficient cross-platform after action review and debrief in distributed training settings. Perform Advanced Development Simulations (ADS) component enhancements and Technology Readiness Assessments in relevant environments. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>2124 / *Air Warfare Training* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** SENSORS AND ENVIRONMENT | 0.640 | 0.487 | 0.525 | 0.000 | 0.525 |
| ***Articles:*** | - | - | - | - | - |

***Description:*** Develop common and platform unique sensor, visual, and environmental simulation (atmospherics or acoustics) into fidelity upgrades with Commercial Off The Shelf and/or Government Off the Shelf (GOTS) Software. Perform risk reduction, advanced displays innovation, test and evaluation, integration, and production of Common Sensor Model, High Fidelity Active-Acoustics Sensor Operator Training, 3D Ocean effects, Anti-Submarine Warfare (ASW) acoustic fidelity assessments, 3D weather effects, 3D Ocean acoustic modeling, new Reduced Oxygen Breathing Device (ROBD)& Spatial Disorientation (SD), and legacy device technologies. Demonstrate GOTS capability for cost-effective database materialization, Material Properties Reference Dataset library, associated NAVAIR Portable Source Initiative specifications and processes for implementation on Distributed Mission Training, deployed trainers, legacy, and new visual system upgrade programs. In support of Navy Aviation Simulation Master Plan (NASMP) upgrade efforts, develop texture storage, sensor-environmental effects, NAVAIR Portable Source Initiative material reference processes/standards, automated technology applications for real time publishing, shadows, cultural lighting, combat, and weather effects and very high resolution visualization technologies, to include tablet-based mission preview for tactical aircrew.

***FY 2016 Accomplishments:***
Support final acquisition plan documentation, specifications, and testing for the Carrier Qualification (CQ) mobility part task trainer prototypes, and for all after action/post-mission assessment technologies. Using sensor fusion, and simulation-based displacement mapping, provide enhanced technology development for low-level flight operations training over water environments, and Terrain-Following, flight training in all weather, sensor environments. Provide enhanced threat presentations with improved tactical behaviors for Next-Generation Threat System application.

***FY 2017 Plans:***
Research the use of consumer-grade image generation engines to deliver simulator visuals that meet the standards of the Navy Aviation Simulator Master Plan. Evaluate augmented reality systems as a replacement for legacy visual systems in high-fidelity flight simulators. Investigate collaborative environmental databases, such as the Geospatial Metaverse, to improve environmental model standardization for cross-platform distributed training and creation time in support of mission rehearsal. Investigate Virtual Reality (VR) improvements and interface with fleet critical sensor and display systems.

***FY 2018 Base Plans:***

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>2124 / *Air Warfare Training* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Develop and test prototype augmented reality based alternate to F/A-18 TOFT visual system. Continue research on use of consumer-grade image generation engines to deliver Navy Aviation Simulator Master Plan quality visuals. Conduct experiments to test limits of collaborative environmental databases to provide time-critical terrain updates for deployable mission rehearsal trainers. Support development of enhanced environmental effects for Naval Aviation Survival Training Program's Virtual Reality Parachute Descent Trainer.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** LIVE VIRTUAL CONSTRUCTIVE (LVC), AND VISUALS | 0.201 | 0.305 | 0.328 | 0.000 | 0.328 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Air Warfare Training Development provides for risk mitigation and next generation platform, Unmanned Aerial Systems, Live Virtual Constructive (LVC) and associated visualization component development for Navy aviation distributed mission training, and distributed training centers (NADTC), as well as for stand-alone and small footprint deployable devices. Provided integrated capability assessment for Ranges, Experimentation products, and Training. (Atlantic Test Range, NAWCAD 5.4, Training Systems Division, and PMA205) Support the NASMP upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Assess trainee cognitive requirements and the development and incorporation of next generation Live Virtual Constructive (LVC), Unmanned Aerial Systems (UAS) constructive and associated debrief/After Action Review (AAR) visualization component technologies. Additionally, Anti-Warfare Training Development (AWTD) provides for advanced virtual component fidelity improvements for Live Virtual Constructive capability (such as "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter (MDBCTT)). LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea battlespace and Naval Integrated Fire Control-Counter Air (NIFC-CA) capabilities development.<br>***FY 2016 Accomplishments:***<br>Provide continued development and prototype Spatial Disorientation training system syllabus, visual system enhancements, and SD research. Provide Office of Naval Research LVC enhancements. Complete Multiplex Data Bus Controller Translator Transmitter initial integration/ demonstrations for F/A-18E/F embedded training capability.<br>***FY 2017 Plans:***<br>Conduct training evaluation on prototype Virtual Reality Deployable Mission Rehearsal Trainer technologies. Validate distributed training technology capability to support cross-platform training for integrated warfighting | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>2124 / *Air Warfare Training* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| capabilities. Investigate capability of low and medium fidelity simulators to support maintenance of complex mission skills in deployed settings.<br>***FY 2018 Base Plans:***<br>Provide analytical and developmental support for emergent programs of record in LVC, acoustic simulation environments, Warfighter performance assessment, threat system enhancements, Virtual Reality (VR), and sensor/visualization modeling. Provide man-in-the-loop /Technology Readiness Level (TRL) assessments at Manned Flight Simulator (MFS), and assess Distributed Mission Readiness Trainer (DMRT) family of systems, and other mobility-focused training devices for improved fleet training, Training and Readiness (T&R) metrics, and life-cycle cost reductions.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.226 | 1.462 | 1.585 | 0.000 | 1.585 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0705: *COMMON GROUND EQUIPMENT - TRAINING* | 184.385 | 184.083 | 192.123 | - | 192.123 | 186.851 | 191.066 | 186.910 | 190.636 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Air Warfare Training Development (AWTD) is a 6.7 RDT&E joint technology transition program tied to Navy Aviation Simulation Master Plan (NASMP), USMC upgrades and the various platform simulation master plans with the purpose of transitioning advanced training and mission preview/rehearsal technologies. AWTD provides risk mitigation, test and evaluation, and prototype development for stand-alone, manned, un-manned, distributed, open systems and deployed training systems for the warfighter utilizing an Integrated Product Team approach and a combination of reimbursable and direct cite/cost-plus time and material (T&M) contracts.

**E. Performance Metrics**

Naval Air Warfare Center-Training Systems Division (NAWC-TSD): # of transitions to Fleet Platforms. For each transition, successful Technical Readiness Level (TRL) testing and device Ready for Training (RFT) to Fleet platforms. Seminal transition events are either RFT or tech-refresh Authority to Operate.

NAWC-Aircraft Division (AD): Complete TRL & compliance testing for NASMP and Information Assurance directives.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>2124 / *Air Warfare Training* |

RSC, Inc.: Government acceptance of evaluation of Small Business Innovation Research (SBIR) device testing.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>3093 / *TACTS/LATR Replacement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3093: *TACTS/LATR Replacement* | 68.450 | 12.676 | 14.962 | 48.473 | - | 48.473 | 57.544 | 35.260 | 6.720 | 4.051 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | 41 | - | 41 | 16 | - | - | - | | |

**A. Mission Description and Budget Item Justification**

3093: The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground datalink, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Inc II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms.

FY18 represents a full year of engineering, manufacturing and development (EMD) for the program, which justifies the control. The program's Preliminary Design Review (PDR) and Critical Design Review (CDR) will be completed in FY18. Both are major required Systems Engineering Technical Review (SETR) events and MDA/ASN(RD&A) knowledge points.

FY18 funding will complete tasking necessary to prepare for Engineering Development Model (EDM) fabrication to begin in 1Q FY19. In FY18, 41 test articles will be procured to include 10 Airborne Subsystems (AS), 15 Rack-mounted Subsystems (RS), 6 Ground Subsystems (GS) and 10 Remote Range Units (RRU). In FY19, 16 test articles will be procured to include 6 RS and 10 RRU. This schedule is necessary to support the MS C timeline and to meet the Fleet IOC need date of 2Q FY22 in order to address critical OPSEC concerns.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TACTS/LATR REPLACEMENT | 12.676 | 14.962 | 48.473 | 0.000 | 48.473 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** TCTS: Qualify and complete the Rangeless Pod system fielding for CVW-5 CVN installation, including the complete Integrated Logistics products and training. Define Test & Training Enabling Achitecture (TENA) compliant interface between TCTS and an Advance Display System (ADS). Develop a Rack-Mounted subsystem for use on rotary wing and transport aircraft. Continue development of the encrypted data link. Develop related training range integration. | | | | | |
| ***FY 2016 Accomplishments:***<br>Conduct Source Selection on responses to the Request For Proposal. Conduct performance, cost, and technical readiness assessment on the proposals. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3093 / *TACTS/LATR Replacement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Conduct MS B and Contract Award, Conduct Integrated Baseline Review to establish a Performance Measurement Baseline with the contractor. Program and engineering events will include a Systems Engineering Technical Review (SETR), Systems Requirements Review II (SRR II), Systems Functional Review (SFR), Integrated Baseline Review (IBR) and a Preliminary Design Review (PDR).<br>***FY 2018 Base Plans:***<br>FY18 represents a full year of engineering, manufacturing and development (EMD) for the program that justifies the current control. It is an increase over previous year's funding since FY17 represents only a partial year of contracted effort. FY18 funding supports Preliminary Design Review (PDR), Critical Design Review (CDR), Systems Engineering Technical Review (SETR) events and post PDR assessments with the Milestone Decision Authority (MDA), per Assistant Secretary of the Navy (Research, Development and Acquisition) ASN(RDA) requested knowledge points. This also includes Engineering Development Model (EDM) fabrication and deliveries of both participant subsystems and ground stations to support Developmental Testing (DT) testing beginning in FY19.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 12.676 | 14.962 | 48.473 | 0.000 | 48.473 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/4204: *Weapons Range Support Equipment (WRSE)/TCTS* | 0.000 | 4.032 | 3.706 | - | 3.706 | 3.876 | 3.884 | 4.081 | 4.147 | Continuing | Continuing |
| • APN/0725: *Other Production Charges/Tactical Combat Training System (TCTS)* | 2.455 | 0.860 | 1.463 | - | 1.463 | 1.475 | 0.087 | 22.070 | 22.511 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Tactical Combat Training System will employ an evolutionary incremental acquisition strategy. This strategy will provide for the development of a system that meets the Operational Requirements Document.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3093 / *TACTS/LATR Replacement* |

**E. Performance Metrics**

Rockwell Collins, Inc.: National Security Agency (NSA) approved encrypted Data Link Transceiver (DLT). Successful Engineering Development Model testing of encrypted DLT requirements with NSA.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>3093 / *TACTS/LATR Replacement* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Development | C/CPIF | ROCKWELL COLLINS, INC : CEDAR RAPIDS, IA | 0.000 | 9.144 | May 2017 | 8.318 | Mar 2017 | 43.921 | Oct 2017 | - | | 43.921 | Continuing | Continuing | Continuing |
| Prior Year Prod Dev No Longer Funded in the Budget or Out Years | Various | Various : Various | 10.901 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 10.901 | 9.144 | | 8.318 | | 43.921 | | - | | 43.921 | - | - | - |

**Remarks**

The FY16 contract for $9M is currently pending a Senate rescission proposed in the FY17 Defense Appropriations Act. Increase in contract cost from FY17 to FY18 reflects revised Life Cycle Cost Estimate (LCCE). See 0204571N R-2 Change Summary for detailed explanation of the cost increase.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | C/CPFF | JACOBS ENGINEERING : RIDGECREST, CA | 3.971 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.971 | 3.971 |
| Systems Engineering | WR | NAWC-WD : CHINA LAKE, CA | 0.683 | 0.179 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | NAWC-AD : PAX RIVER, MD | 7.026 | 1.517 | Dec 2015 | 2.809 | Jan 2017 | 2.756 | Nov 2017 | - | | 2.756 | Continuing | Continuing | Continuing |
| Logistics | WR | NAWC-AD : PAX RIVER, MD | 0.000 | 0.279 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.279 | 0.279 |
| Prior Year Support No Longer Funded in the Budget or Out Years | Various | Various : Various | 24.144 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 35.824 | 1.975 | | 2.809 | | 2.756 | | - | | 2.756 | - | - | - |

**Remarks**

Jacobs Engineering formerly Tybrin Corporation.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>3093 / *TACTS/LATR Replacement* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NAWC-AD : PAX RIVER, MD | 1.337 | 0.164 | Dec 2015 | 0.588 | Jan 2017 | 0.588 | Nov 2017 | - | | 0.588 | Continuing | Continuing | Continuing |
| Prior Year T&E No Longer Funded in the Budget or Out Years | Various | Various : Various | 3.425 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.762 | 0.164 | | 0.588 | | 0.588 | | - | | 0.588 | - | - | - |

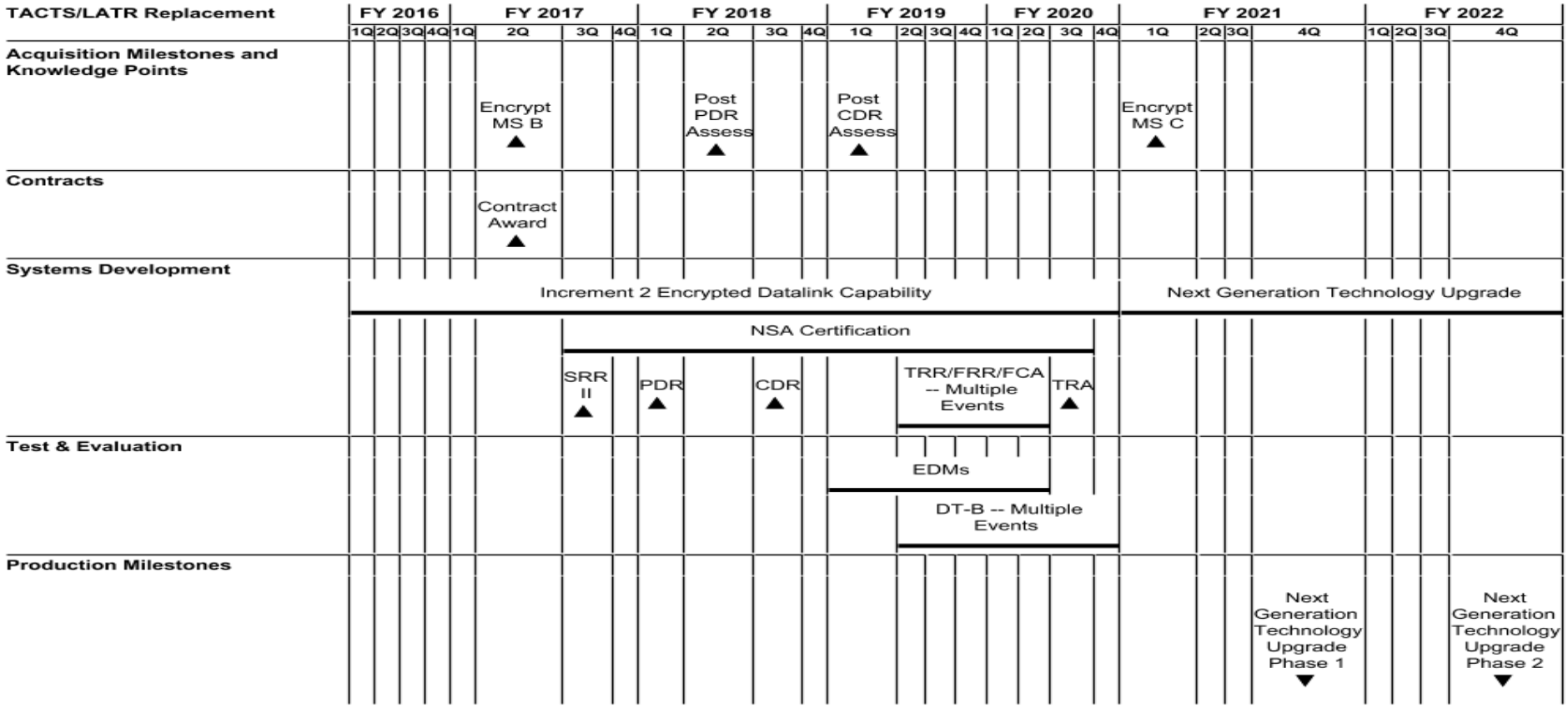
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prog Mgnt Sup | WR | NAWC-AD : PAX RIVER, MD | 0.811 | 1.388 | Dec 2015 | 3.237 | Jan 2017 | 1.181 | Nov 2017 | - | | 1.181 | Continuing | Continuing | Continuing |
| Travel | Allot | NAVAIR : PAX RIVER, MD | 0.093 | 0.005 | Dec 2015 | 0.010 | Jan 2017 | 0.027 | Nov 2017 | - | | 0.027 | Continuing | Continuing | Continuing |
| Prior Year Mgmt No Longer Funded in the Budget or Out Years | Various | Various : Various | 16.059 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 16.963 | 1.393 | | 3.247 | | 1.208 | | - | | 1.208 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 68.450 | 12.676 | | 14.962 | | 48.473 | | - | | 48.473 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3093 / *TACTS/LATR Replacement* |




*2018OSD - 0204571N - 3093*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3093 / *TACTS/LATR Replacement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***TACTS/LATR Replacement*** | | | | |
| Acquisition Milestones and Knowledge Points: Encryption MS B | 2 | 2017 | 2 | 2017 |
| Acquisition Milestones and Knowledge Points: Post PDR Assessment | 2 | 2018 | 2 | 2018 |
| Acquisition Milestones and Knowledge Points: Encryption MS C | 1 | 2021 | 1 | 2021 |
| Acquisition Milestones and Knowledge Points: Post CDR Assessment | 1 | 2019 | 1 | 2019 |
| Contracts: Contract Award | 2 | 2017 | 2 | 2017 |
| Systems Development: Increment 2 Encrypted Datalink Capability | 1 | 2016 | 4 | 2020 |
| Systems Development: Next Generation Technology Upgrade | 1 | 2021 | 4 | 2022 |
| Systems Development: NSA Encryption Certification | 3 | 2017 | 3 | 2020 |
| Systems Development: System Readiness Review II | 3 | 2017 | 3 | 2017 |
| Systems Development: Preliminary Design Review | 1 | 2018 | 1 | 2018 |
| Systems Development: Critical Design Review | 3 | 2018 | 3 | 2018 |
| Systems Development: Test Readiness Review/ Flight Readiness Review/ Functional Configuration Audit | 2 | 2019 | 2 | 2020 |
| Systems Development: Technology Readiness Assessment | 3 | 2020 | 3 | 2020 |
| Test & Evaluation: Engineering Development Models | 1 | 2019 | 2 | 2020 |
| Test & Evaluation: Developmental Test - Multiple Events | 2 | 2019 | 4 | 2020 |
| Production Milestones: Next Generation Technology Upgrade Phase 1 | 4 | 2021 | 4 | 2021 |
| Production Milestones: Next Generation Technology Upgrade Phase 2 | 4 | 2022 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204571N / *Consolidated Trng Sys Dev* | Project (Number/Name)<br>3356 / *High Fidelity Surface Trainers* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3356: *High Fidelity Surface Trainers* | 16.306 | 4.708 | 6.570 | 1.183 | - | 1.183 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 28.767 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This line funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers to support all Advanced Capability Build (ACB) and below Aegis baselines, as well as the mine warfare mission. This line provides SEA 21 (PMS 339) funds for development of a High Fidelity Aegis Combined Integrated Air and Missile Defense (IAMD) and Anti-Submarine Warfare (ASW) Trainer (CIAT) to enable advanced warfare training (AWT) Phase II objectives to be accomplished ashore and to support Active and Passive Sonar Operations, Target Motion Analysis, Sonobuoy Localization, Command and Control, and execution of ASW Kill chain. Funds are provided for advanced component technology development, prototype evaluation, and technology readiness level assessment. Development of these trainers is in response to CNO Wholeness Review and COMNAVSURFOR requirements. This line also provides funds for the research and development of advanced technologies to support BMD 5.XX and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Combined IAMD ASW Trainer (CIAT) | 4.708 | 4.500 | 0.607 | 0.000 | 0.607 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Developed simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Researched and Developed Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Researched and Developed a solution to virtualize AEGIS legacy tactical code to be able to re-host the tactical software on COTS hardware. These solutions supported scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Researched and Developed technologies and interfaces which will enable ASW trainers to be integrated with IAMD training system for integrated training events. Researched and Developed models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training. | | | | | |
| ***FY 2017 Plans:***<br>Complete development of simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Research and Develop Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Research and Develop a solution to virtualize AEGIS legacy tactical code to be able to re- | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3356 / *High Fidelity Surface Trainers* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| host the tactical software on COTS hardware. These solutions will support scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Research and Develop technologies and interfaces which will enable ASW trainers to be integrated with IAMD training system for integrated training events. Research and Develop models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training.<br>***FY 2018 Base Plans:***<br>Complete research and development spirals of all simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Research and Develop Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Test and evaluate the developed solution to virtualize AEGIS legacy tactical code to be able to re-host the tactical software on COTS hardware. These solutions will support scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Research and Develop technologies and interfaces which will enable ASW and Electronic Warfare (EW) trainers to be integrated with IAMD training system for integrated training events. Test and Integrate developed models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Aegis BMD Ashore and Aegis BMD Ship Training<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Research and develop advance technologies to allow BMD 5.XX and C4I advanced technology upgrades to Aegis BMD Ashore Team Trainer at CSCS Unit Dam Neck. Upgrade serves as an enabling technology for the execution of training directed in CNSF 8820 series BMD Qualification instruction which requires watch teams to certify on the same BMD baseline as the BMD platform they are assigned.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:*** | 0.000<br>- | 2.070<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3356 / *High Fidelity Surface Trainers* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Air Defense Strike Group Facility | 0.000 | 0.000 | 0.576 | 0.000 | 0.576 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>Research and develop two Virtual Aegis Combat System Simulators (VACSSIM) to develop the Engineering Development Model for the Air Defense Strike Group Facility (ADSGF) shore-based air and surface simulation device. Research and develop advanced technologies to allow VACSSIM improvements in support of surface equities incorporated in Aegis B/L upgrades. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.708 | 6.570 | 1.183 | 0.000 | 1.183 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The software development for High Fidelity Surface Trainers is accounted for in this RDT&E line. All production kits are procured in OPN PE 0804731N BLI 5662/5664. The software development and introduction for the BMD 5.XX and C4I advanced technology upgrades to Aegis BMD Ashore Team Trainer is accounted for in this RDT&E line. These upgrades will provide an enabling technology to an existing training system.

**E. Performance Metrics**

NSWC Dahlgren: Approved Combined IAMD and ASW Trainer (CIAT). Successful engineering development model (EDM) introducing advanced technologies necessary to simulate/stimulate the AEGIS Combat System elements required for operators stated in AEGIS Ashore Baseline 9 Weapons Specification (WS) 21200 series.

NSWC Dahlgren: Incorporation of approved legacy Aegis baselines (7.2, 6.3) into the Virtual Aegis Combat System Simulator.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204571N / *Consolidated Trng Sys Dev* | **Project (Number/Name)**<br>3356 / *High Fidelity Surface Trainers* |

NAWCTSD: Approved BMD 5.XX and C4I advanced technology upgrades to the Aegis BMD Ashore Team Trainer.

NSWC Carderock: Approved Combined IAMD & ASW Trainer (CIAT). Successful engineering development model introducing advanced technologies necessary to 1) simulate performance of AN/SQQ-89A(V)15 sonar system in alignment with fielding plan for initial Sonar software versions with capability to receive AN/SQQ-89A(V)15 coordinated routine modernizations and 2) replicate Combat Information Center (CIC) configuration and functionalities representative of AEGIS Baseline 9.

NUWC Newport: Approved Combined IAMD & ASW Trainer (CIAT). Develop ASW components to be integrated in the CIAT system for Technology Requirements Model (TRM) simulation of own ship and threat torpedoes, and emulations of sonar devices.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0204574N *I Cryptologic Direct Support* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 19.754 | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 | 2.328 | 2.362 | 2.378 | 2.427 | Continuing | Continuing |
| 3091: *Advanced Cryptological Sys Eng (CCOP)* | 19.754 | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 | 2.328 | 2.362 | 2.378 | 2.427 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Advanced Cryptologic Systems Engineering - The Cryptologic Carry-on Program develops state-of-the-art signal acquisition systems and software in response to Combatant Command requirements for a quick-reaction surface cryptologic carry-on capability. There are 124 cryptologic capable surface ships and shore sites in the current Navy inventory; each of these is a potential user of this carry-on equipment, depending on deployment schedules and the tempo of operations. In addition, numerous other Navy and Coast Guard platforms are potential users.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 1.915 | 1.122 | 1.236 | - | 1.236 |
| Current President's Budget | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 |
| Total Adjustments | 0.000 | 0.000 | -0.081 | 1.200 | 1.119 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.085 | 1.200 | 1.115 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.004 | - | 0.004 |

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204574N / *Cryptologic Direct Support* | Project (Number/Name)<br>3091 / *Advanced Cryptological Sys Eng (CCOP)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3091: *Advanced Cryptological Sys Eng (CCOP)* | 19.754 | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 | 2.328 | 2.362 | 2.378 | 2.427 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Advanced Cryptologic Systems Engineering - Cryptologic Carry On Program (CCOP) develops state-of-the-art signal acquisition systems and software in response to Combatant Command requirements for a quick-reaction surface, subsurface and airborne cryptologic carry-on capability. There are approximately 124 cryptologic capable surface ships and shore sites in the current Navy inventory; each is a potential user of this carry-on equipment, depending on deployment schedules and the tempo of operations. In addition, there are numerous subsurface and air platforms that are also potential users. This funding line will provide the resources to enable rapid transition of available Commercial Off-The-Shelf (COTS) and Government Off -The-Shelf (GOTS) technologies that apply to Fleet requirements for carry-on system functionalities. These technologies typically require various levels of integration to leverage on-board systems that provide system and mission management, product reporting, and data analysis. COTS/GOTS system documentation and training materials usually require adaptation or modification to meet fleet operator requirements, or entirely new training materials may need to be developed. Before deployment for operational use, systems must be systematically tested to ensure suitable and reliable operation, tested for network vulnerabilities if connected to shipboard Local Area Networks, and tested relative to interoperability requirements. Certification testing is conducted to meet Office of Naval Intelligence security requirements, and network testing is conducted in accordance with Information Technology (IT) requirements to allow connection to Navy networks. Funding will also provide resources to address rapid deployment of enhancements or improvements to the common hardware and/or software baseline of all other carry-on subsystems to meet emergent requirements.

Funding will support development and integration efforts to fuse data produced and distributed by Shipboard IW/Information Operations (IO) systems with other intelligence data at multiple classification levels and provided to shipboard combat systems to support kinetic and non-kinetic fires and can also be used to enable a more complete understanding and more agile and effective exploitation of the electromagnetic spectrum.

FY18 funds will continue to integrate, test, and document identified COTS and GOTS technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the Signals of Interest (SOI) and target threat list. Funds will continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Funds will aid the development of new signal processing algorithms and software based solutions to enable rapid transition to permanently installed Ship's Signal Exploitation Space (SSES) systems, the research of self contained small form factor systems for Patrol craft and other small units, and the research of Adaptive Mission Modules for rapid insertion to counter specific threats or provide intelligence in specific areas of operation.

FY18 OCO funds will develop target signal files in order to counter the latest threats. New threat signal files must be developed and fielded to forward deployed platforms.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204574N / *Cryptologic Direct Support* | **Project (Number/Name)**<br>3091 / *Advanced Cryptological Sys Eng (CCOP)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Advanced Cryptological Sys Eng - CCOP | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued to integrate, test and document identified COTS and GOTS technologies and subsystems that met emergent and on-going Fleet requirements as specified in the SOI and targeted threat list. Continued to develop upgrades to existing systems and subsystems according to Fleet requirements. Continued the development of new signal processing algorithms and software based solutions to enable rapid transition to permanently installed SSES systems and the research of self contained small form factor systems for Patrol craft and other small units. Continued to develop enhanced Red Falcon systems to combat future SOI. | | | | | |
| ***FY 2017 Plans:***<br>Continue to integrate, test and document identified Commercial Off-The-Shelf (COTS) and Government Off -The-Shelf (GOTS) technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the Signals of Interest (SOI) and target threat list. Continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Continue the development of new signal processing algorithms and software based solutions to enable rapid transition to permanently installed Ship's Signal Exploitation Space (SSES) systems and the research of self contained small form factor systems for Patrol craft and other small units. Continue to develop enhanced Red Falcon systems to combat future SOIs. Research Adaptive Mission Modules for specific threats/areas. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue to integrate, test and document identified COTS and GOTS technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the SOI and target threat list. Continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Continue the development of new signal processing algorithms and software based solutions to enable rapid transition to permanently installed Ship's Signal Exploitation Space (SSES) systems and the research of self-contained small form factor systems for Patrol craft and other small units. Continue to develop enhanced Red Falcon systems to combat future SOI. Continue to research Adaptive Mission Modules for specific threats/areas. | | | | | |
| ***FY 2018 OCO Plans:***<br>FY18 OCO funds will develop target signal files in order to counter the latest threats. New threat signal files must be developed and fielded to forward deployed platforms. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.915 | 1.122 | 1.155 | 1.200 | 2.355 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204574N / *Cryptologic Direct Support* | **Project (Number/Name)**<br>3091 / *Advanced Cryptological Sys Eng (CCOP)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN / 3501: *Cryptologic Communications Equipment* | 11.433 | 21.098 | 25.487 | 2.280 | 27.767 | 24.748 | 25.808 | 29.236 | 29.158 | 0.000 | 229.802 |

**Remarks**

**D. Acquisition Strategy**

Acquisition, management, and contracting strategies are to support engineering and manufacturing development by providing funds to Space and Naval Warfare (SPAWAR) Systems Centers Atlantic and Pacific, and miscellaneous contractors with management oversight by SPAWAR.

**E. Performance Metrics**

Cryptologic Carry On Program (CCOP) will deliver state-of-the-art signal acquisition software for CCOP systems in response to Combatant Command requirements for a quick-reaction surface, subsurface and airborne cryptologic carry-on capability.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0204575N *I Elect Warfare Readiness Supt* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 17.647 | 44.727 | 99.998 | 51.040 | - | 51.040 | 70.389 | 72.683 | 72.915 | 74.265 | Continuing | Continuing |
| 2263: *Information Warfare System* | 17.647 | 44.727 | 99.998 | 32.740 | - | 32.740 | 49.989 | 52.183 | 52.015 | 52.965 | Continuing | Continuing |
| 3426: *Maritime Cyber* | 0.000 | 0.000 | 0.000 | 18.300 | - | 18.300 | 20.400 | 20.500 | 20.900 | 21.300 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

Research, assess, and develop information warfare capabilities.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 46.403 | 99.998 | 107.905 | - | 107.905 |
| Current President's Budget | 44.727 | 99.998 | 51.040 | - | 51.040 |
| Total Adjustments | -1.676 | 0.000 | -56.865 | - | -56.865 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.676 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -56.865 | - | -56.865 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204575N / *Elect Warfare Readiness Supt* | Project (Number/Name)<br>2263 / *Information Warfare System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2263: *Information Warfare System* | 17.647 | 44.727 | 99.998 | 32.740 | - | 32.740 | 49.989 | 52.183 | 52.015 | 52.965 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Information Operations (IO) Counter Measure Capability Research and Development: Develops software to account for antenna modeling, weather calculations, radio frequency modeling, signals mapping and terrain modeling for warfighter use in configuring optimal Electronic Attack (EA) from afloat.

Maritime Cryptologic Systems for the 21st Century Systems Development and Support: Develops and fields spiral Electronic Support, and cyber capabilities against U.S. Navy's prioritized signals, networks, and target sets. EA capabilities will be integrated into a software architecture baseline that is deployed on subsurface, airborne and surface Information Operations (IO) platforms (Classic Troll, Banshee and Ships Signal Exploitation Equipment Increment E and Increment F) sponsored Pacific Sail (PACSAIL) research project. Signal Descriptor File (SDF) Configuration Management Authority (SCMA) is the technical lead for the development, testing and validation of electronic support and electronic attack techniques for Maritime Cryptologic Systems in support of Navy-wide Information Operations planning.

Research, Analysis and Research and Development Technical Support: Conducts vulnerability analysis and reverse engineering on emerging threats and targets and provides specialized technical, engineering and management capabilities to the program management office.

Computer Network Operations (CNO): Funds development and testing of computer networks for modeling, simulation, and tailoring of Cyber capabilities. Develops specific Cyber tools, techniques, and operators in support of Fleet Cyber Command and Commander, TENTH Fleet requirements. (Specific development details held at a higher classification level). Conducts vulnerability analyses and reverse engineering on improvised explosive devices (Specific details held at a higher classification level)

Twisted Web: A developmental capability that improves Fleet ability to safely operate in all ocean areas by reducing adversary capability to engage kinetically. Funds risk reduction and system engineering development for project initiation. (Specific details held at a higher classification level) Transferred to a classified line for FY18.

Mocking Jay: Develop cyber capabilities in the maritime domain. Project is an analytical and engineering effort which enables development of new operating (classified) systems and cyber weapons delivery. Funds additional development and testing of networks for vulnerability analysis, reverse engineering, simulation systems, and closed development networks. Additionally, funds Cyber Foundry, Cyber Infrastructure and the R&D Site to support the Navy's portion of USCYBERCOM planned Unified Platform and Cyber Mission Force. Details can be provided separately in an appropriate environment. Starting in FY18, Mocking Jay moved to from project 2263 Information Warfare System to projected 3426 Maritime Cyber.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Electronic Warfare / Information Operations (IO) Countermeasure Capability Research & Development | 15.478 | 22.408 | 19.443 | 0.000 | 19.443 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develops and uses modeling and simulation techniques to prototype and test emergent waveforms. Funds support additional site infrastructure updates for collection efforts, extend technical understanding, continue capability development, and deliver stand-alone Prototypes to test and integrate waveforms for countering adversary systems. In addition, conducts research operations to provide Strategic Indications and Warnings (I&W) and OPINTEL analysis (Details held at a higher classification level). IO Countermeasure Capability R&D processes used to develop, test, prototype, and integrate electronic attack wave forms are nearly identical to Maritime Cryptologic Systems (MCS-21), involve its own unique set of signal types . | | | | | |
| ***FY 2016 Accomplishments:***<br>*Conducted collection efforts of new and emerging signal types, in support of capability development (details held at a higher classification level)<br>*Site (VAL) infrastructure updated to support additional evolving collection efforts, further technical understanding, and capability development (details held at a higher classification level)<br>*Measures of Effectiveness (MOE) software development and Graphical User Interface (GUI) updates completed (details held at a higher classification level)<br>*Provided technical information to increase effectiveness of Information Operations (IO) systems development/ planning and situational awareness. In addition, conducted dynamic research operations to provide Strategic Indications and Warnings (I&W) and OPINTEL analysis (Details held at a higher classification level)<br>*Hosted Table Top Exercise (TTX) to identify requirements for CONOP development<br>*Site infrastructure updates supports Antenna infrastructure and Sensitive Compartmented Information Facility (SCIF) construction and accreditation supporting R&D effort at Navy Cyber Warfare Development Group (NCWDG) - additionally enhanced existing R&D hardware/software systems and infrastructure - duration for this effort was:<br>- Civil works began 4Q FY16 | | | | | |
| ***FY 2017 Plans:***<br>*All FY17 activities are iterative in a dynamic and evolving signals environment<br>*Developing and testing IO Countermeasures capabilities across various platforms<br>*Developing specific waveforms to attack adversary systems<br>*Developing and using modeling and simulations techniques to prototype and test emergent waveforms | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *Modeling and Simulation Lab (Applied/projected level of effort)<br>*Information Warfare (IW) / Information Operations (IO) / Electronic Attack (EA) capability development (Details held at a higher classification level)<br>*Waveform Weapon Development<br>*Develop and Test Capability in a maritme operational environment<br>*Continue to conduct collection efforts in support of capability development<br>*Additional Site infrastructure updates to support collection efforts, extend technical understanding, and continue capability development<br>*Continue to provide technical information to increase effectiveness of Information Operations (IO) systems development/planning and situational awareness.<br>*Continue to conduct search operations to provide strategic Indications and Warnings (I&W) and OPINTEL analysis<br>*Prime contract kickoff<br>*Initial technology engineering and design, (Details held at a higher classification level)<br>*Site infrastructure updates supports Antenna infrastructure and SCIF construction and accreditation supporting R&D effort at NCWDG - Additionally enhance existing R&D hardware/software systems and infrastructure for IO infrastructure capabilities - proposed duration for this effort is:<br>- Civil works further development 1Q 17<br>- Antenna and SCIF completion/accreditation end of 3Q 17 | | | | | |
| ***FY 2018 Base Plans:***<br>*All FY18 activities are iterative in a dynamic and evolving signals environment<br>*Additional Site infrastructure updates are to support search and survey efforts, and further technical understanding and capability development. Additionally, Develop and Test Capabilities in a maritime operational environment, and deliver stand-alone prototypes to test and integrate different systems. Funds supports additional hardware and software required to transition these capabilities to the fleet<br>*Developing and testing IO Countermeasures capabilities across various platforms<br>*Additional Site infrastructure updates to support collection efforts, further technical understanding, and capability development<br>*Integrate Information Operations (IO) / Electronic Attack (EA) capability into fleet systems and platforms (Details held at a higher classification level) | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *Develop and Test Capabilities in a maritime operational environment (Details held at a higher classification level) *Continue to conduct search operations to provide strategic Indications and Warnings (I&W) and OPINTEL analysis,<br>*Deliver stand-alone prototypes to test and integrate waveforms for countering adversary systems<br>*Conduct software updates and system maintenance on search and survey systems<br>*Continue to provide technical information to increase effectiveness of Information Operations (IO) systems development/planning and situational awareness<br>*Conduct surveys and planning for additional search and survey site<br>*Modeling and Simulation Lab (Applied/projected level of effort) (Details held at a higher classification level)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Electronic Warfare Readiness/ Maritime Cryptologic Systems (MCS-21) Development | 3.366 | 3.035 | 3.000 | 0.000 | 3.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develops and fields spiral Electronic Support (ES), Electronic Attack (EA) and cyber capabilities against Fleet Forces Command prioritized signals, networks and target sets. Capabilities will be integrated into a software architecture baseline that is deployed on subsurface, airborne and surface. Also, Information Operations platforms (Classic Troll, Banshee and Ships Signal Exploitation Equipment Increment E and F). Signal Descriptor File (SDF) Configuration Management Authority (SCMA) is the technical lead for the development, testing and validation of ES and EA techniques for Maritime Cryptologic Systems in support of Navy-wide Information Operations planning. (Details held at higher classification level). The MCS-21 processes used to develop, test, prototype, and integrate electronic attack wave forms are nearly identical to IO Countermeasure Capability R&D, however, involve its own unique set of classified signal types.<br><br>Please note, there are several similarities between MCS-21 development and IO countermeasure efforts. The process used to develop, test, prototype and integrate electronic attack wave forms regardless of the system or signal type are nearly identical. The difference is the IO countermeasure R&D effort is developing capabilities for a different set of signal types (details classified) than the MCS-21 development. Additionally the MCS-21 development directly ties into Fleet program of record systems (i.e. introducing new wave forms to existing systems) , whereas the IO countermeasure effort is creating new wave forms for a new system.<br><br>***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *All accomplishments are iterative in nature, however are performed on emerging and evolving target sets and signals<br>*Upgraded and enhanced SDF remote capability<br>*Upgraded SDF development and validation systems to maintain concurrency with systems on maritime platforms (software)<br>*Developed IW/IO/EA capabilities and integrated into Fleet POR systems. (Details held at higher classification level)<br>*Developed specific wave form (EA) Research and Analysis (Details held at higher classification level)<br>*Tested SDF and EA capabilities to ensure compatibility with Fleet POR systems (Details held at higher classification level)<br>*Developed Initial Capability for Remote SDF development<br>*Developed ES (SDF) Research, Development and Analysis<br>*Developed a capability to rapidly demodulate and decode FFC priority signals (Details held at higher classification level) | | | | | |
| ***FY 2017 Plans:***<br>*Develop and test IO Countermeasures capabilities across various platforms<br>*Develop specific waveforms to attack adversary systems<br>*Develop and use modeling and simulations techniques to prototype and test emergent waveforms.<br>*Modeling and Simulation Lab (Applied/projected level of effort)<br>*Develop IW/IO/EA (Details held at a higher classification level)<br>*Waveform Weapon Development which includes a system to host electronic support and electronic attack capabilities MCS-21 Planning Optimization and Tasking Service (MPOTS) for lighthouses<br>*Upgrade current SDF development and validation systems to maintain concurrency with systems on maritime platforms. *Develop back-up (COOP) for remote SDF capability<br>*Increase development and testing of electronic attack capabilities across maritime platforms<br>*Upgrade systems and infrastructure to support next generation electronic support and electronic attack capability development<br>*Full Operating Capability for Remote SDF capability<br>*As a result of enhanced development capabilities, the number of priority signals that can be demodulated and decoded has increased. (Details held at higher classification level) | | | | | |
| ***FY 2018 Base Plans:***<br>*Develop and test IO Countermeasures capabilities across various platforms | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *Develop specific waveforms to attack adversary systems.<br>*Develop and use modeling and simulations techniques to prototype and test emergent waveforms<br>*Modeling and Simulation Lab (Applied/projected level of effort)<br>*Information Warfare (IW) / Information Operations (IO) Electronic Attack (EA) capability development (Details held at a higher classification level)<br>*Waveform Weapon Development<br>*Integrate MPOTS 3.x with CLASSIC REACH<br>*Upgrade current SDF development and validation systems to maintain concurrency with systems on maritime platforms (software upgrade)<br>*Increase development and testing of electronic attack capabilities across maritime platforms<br>*Upgrade systems and infrastructure to support next generation electronic support and electronic attack capability development. As a result of enhanced development capabilities, the number of priority signals that can be demodulated and decoded has increased (Details held at higher classification level)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Electronic Warfare/Research, Analysis and R&D Technical Support | 4.335 | 5.255 | 5.497 | 0.000 | 5.497 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Conducts vulnerability analysis and reverse engineering on emerging threats and targets and provides specialized technical, engineering and management capabilities to the program management office. Funding is required for development and use of modeling and simulations techniques to prototype and test emergent waveforms (Details held at higher classification level).<br><br>***FY 2016 Accomplishments:***<br>*A communications vulnerability study was conducted (Specific details held at a higher classification level)<br>*Microprocessor reverse engineered work, Radio Detection and Ranging (RADAR) vulnerability research & support<br>*Maritime Network Lab research and proof of concept<br>*Weak Signal study<br>*Industrial Internet of Things study (Details held at higher classification level)<br>***FY 2017 Plans:***<br>*Developing specific waveforms to attack adversary systems | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *Develop and use modeling and simulations techniques to prototype and test emergent waveforms<br>*Modeling and Simulation Lab (Applied/projected level of effort)<br>Information Warfare(IW),Information Operations (IO) Electronic Attack (EA) capability development, Waveform Weapon Development<br>*Technical and intelligence related studies and contractor engineering, technical and management capabilities<br>*Research and Analysis (Details held at higher classification level)<br>*Defense Cyber Operations (DCO) study<br>*Cellular vulnerablity study<br>*RADAR vulnerability research and support<br>*Maritime Network Lab research and proof of concept<br>*Weak Signal study<br>*Two studies related to emergent DCO and/or OCO topics. (Details held at higher classification level).<br>***FY 2018 Base Plans:***<br>*Developing specific waveforms to attack adversary systems<br>*Develop and use modeling and simulations techniques to prototype and test emergent waveforms<br>*Modeling and Simulation Lab (Applied/projected level of effort)<br>Information Warfare(IW),Information Operations (IO) Electronic Attack (EA) capability development, Waveform Weapon Development<br>*Technical and intelligence related studies and contractor engineering, technical and management capabilities<br>*Research and Analysis (Details held at higher classification level)<br>*DCO study<br>*Cellular vulnerablity study<br>*RADAR vulnerability research and support<br>*Maritime Network Lab research and proof of concept<br>*Weak Signal study<br>*Two studies related to emergent DCO and/or OCO topics (Details held at higher classification level)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Electronic Warfare/Computer Network Operations (CNO) | 4.646 | 4.769 | 4.800 | 0.000 | 4.800 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** Funds development and testing of computer networks for modeling, simulation, and tailoring of Cyber capabilities. Develop specific Cyber tools, techniques, and operators in support of Fleet Cyber Command and Commander, TENTH Fleet requirements. Conduct vulnerability analysis and reverse engineering on improvised explosive devices. Increased, analytical and engineering effort to develop cyber capabilities in the maritime domain, Funds additional development and testing of computer networks for vulnerability analysis, reverse engineering and simulation systems, and closed development networks (Details held at a higher classification level).<br><br>***FY 2016 Accomplishments:***<br>*Modernization and security enhancements for existing capabilities<br>*Technical support<br>*Portfolio of studies and development efforts focused on providing access (Specific details held at a higher classification level)<br>*Phased tech refresh for development network, and development specific software requirements (Details held at a higher classification level)<br><br>***FY 2017 Plans:***<br>*Develop new capabilities, modernization and security enhancements of existing capabilities<br>*Developing system software upgrades and tech support<br>*Portfolio of studies and development efforts focused on providing access (Specific details held at a higher classification level)<br>*Phased tech refresh for development network, and development specific software requirements (Details held at a higher classification level)<br><br>***FY 2018 Base Plans:***<br>*Develop new capabilities, modernization and security enhancements of existing capabilities<br>*Developing system software upgrades and tech support<br>*Portfolio of studies and development efforts focused on providing access (Specific details held at a higher classification level)<br>*Phased tech refresh for development network, and development specific software requirements (Details held at a higher classification level)<br><br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Twisted Web | 6.279 | 40.154 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This is a classified ACAT III program to deliver cyber capability. We are close to an ACAT II and after the culmination of Phase I on OCT 21, 2016, we can reassess our program organization. The project delivers critical counter Intelligence, Surveillance, and Reconnaissance (ISR) protection to the Fleet. This funding will support a developmental capability that improves Fleet ability to safely operate in all ocean areas by reducing adversary capability to engage kinetically. Funds risk reduction and system engineering development for project initiation. (Details available at classified level). | | | | | |
| ***FY 2016 Accomplishments:***<br>*The funding was used to support Risk Reduction Efforts ahead of project kickoff<br>*Technical Studies were conducted in order to provide potential solutions for the capability production phase.<br>*A Statement of Work (SOW) was utilized in development which is critical for the execution of the capability production phase<br>*A basis of estimates was developed to better understand the costs of the potential solutions for the capability production phase<br>*In addition, there is a continuous evaluation of Fleet capabilities and operations that affect system specifications<br>*Modeling and Simulation techniques were used to characterize the operating environment(Details available at classified level) | | | | | |
| ***FY 2017 Plans:***<br>*A Prime contractor will be chosen and there will be a contract kickoff meeting for the capability production phase.<br>*The initial technology engineering and design phase for the foundation for system development<br>*Extensive and Critical software development to ensure system operations<br>*Site Cyber infrastructure development begins in order to prepare for installation efforts in support of RDT&E,N.<br>*Continue evaluation of Fleet capabilities and operations which affect system specifications<br>*Modeling and simulation techniques to evaluate expected system performance and characterize operating environment(Details available at classified level)<br>*Get closer to an ACAT II and after the culmination of Phase I (OCT 21, 2016) | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| *Reassess program organization ACAT status<br>***FY 2018 Base Plans:***<br>FY18 Funding transfer to a Classified line<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TFCA<br>***Articles:***<br>***Description:*** Description: Task Force Cyber Awakening (TFCA) as directed by the CNO, provides cyber security investments to expand Operation Rolling Tide (ORT) approach to address near term and executable vulnerabilities across Platform IT (PIT) capabilities. These projects and capabilities include the studies and analysis to support PIT improvements to ensure systems are optimally configured to enhance Navy's ability to maneuver in this expanding environment.<br>***FY 2016 Accomplishments:***<br>* New project kicked off<br>* Completed initial studies and Analysis for vulnerability assessment<br>* Completed initial plans for PIT improvements and system configurations<br>***FY 2017 Plans:***<br>Starting in FY17, funding for this effort was transferred to Operations and Maintenance, Navy (O&M,N).<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 3.000<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** Mocking Jay<br>***Articles:***<br>***Description:*** Analytical and engineering effort to develop cyber capabilities in the maritime domain. Produces Cyber capabilities to meet Navy requirements. Increased funding provides physical space for the Cyber Research & Development team. Enables development of new operating (classified) systems and cyber weapons | 7.623<br>- | 24.377<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| delivery. Provides Navy contribution to the USCYBERCOM planned Unified Platform and Cyber Mission Force(Details held at a higher classification level).<br><br>***FY 2016 Accomplishments:***<br>*MOCKINGJAY was a new project that started in FY16<br>*Developed intelligence analysis to determine specific technical vulnerabilities for Computer Network Operations<br>*Initiated development and testing of computer networks for modeling, simulation, demonstration and tailoring of Cyber capabilities<br>*Expanded new cadre of Cyber operators, capable of multi-mission Cyber development(Details held at a higher classification level)<br><br>***FY 2017 Plans:***<br>*Further development of intelligence analysis to determine specific technical vulnerabilities for Computer Network Operations<br>*Fund the technical research, target development and testing of computer networks for modeling, simulation, demonstration and tailoring of Cyber capabilities<br>*Provides physical space to accommodate intelligence analysts, engineers, and Cyber developers<br>*Fund specialized information technology and exploitation capability in order to create a premier Navy Cyberspace development capability<br>*Fund the Cyber Infrastructure to support technical Research & Development of the Navy portion of the USCYBERCOM planned Unified Platform (Details held at a higher classification level)<br><br>***FY 2018 Base Plans:***<br>FY18 funding for MOCKING JAY realigning from project 2263 Information Warfare Systems to project 3426 Maritime Cyber.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 44.727 | 99.998 | 32.740 | 0.000 | 32.740 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

**D. Acquisition Strategy**

These Projects are designated both ACAT III and non-ACAT and operate under streamlined acquisition. The non-ACAT designation supports a streamlined acquisition process using the Advanced Concept Technology Demonstration documentation of the Defense Acquisition Guidance.

**E. Performance Metrics**

Measures include quality and impact of new ideas and approaches, the success of the technology application in satisfying Combatant Commanders and Fleet requirements, and successful cost effective transition of the capability into operational systems. The goal of these investments is to provide to Commanders non-kinetic options to influence adversaries and prevent escalation of crises. Due to the nature and classification of these efforts, qualitative measures are used. It is the intent through the development of modeling and simulation scenarios and capabilities to develop quantitative metrics. The success of this depends heavily on the insight obtained via various intelligence community efforts.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | Various | Classified-1 : Classified | 2.200 | 11.610 | Nov 2015 | 22.346 | Oct 2016 | 5.697 | Nov 2017 | - | | 5.697 | Continuing | Continuing | Continuing |
| System Engineering | SS/CPFF | Applied Research Laboratory : University Park, PA | 3.589 | 4.296 | Dec 2015 | 8.932 | Dec 2016 | 3.952 | Dec 2017 | - | | 3.952 | 0.000 | 20.769 | - |
| Systems Engineering | WR | NRL : Washington, DC | 3.084 | 8.620 | Oct 2015 | 10.360 | Oct 2016 | 3.725 | Oct 2017 | - | | 3.725 | 0.000 | 25.789 | - |
| Ancillary Hardware Development | Various | Classified : Classified | 0.000 | 0.000 | | 5.000 | Nov 2016 | 2.367 | Dec 2017 | - | | 2.367 | 0.000 | 7.367 | - |
| Training Development (Classified) | Reqn | Classified : Classifed | 0.500 | 0.000 | | 0.910 | Oct 2016 | 0.950 | Oct 2017 | - | | 0.950 | 0.000 | 2.360 | - |
| Training Development (CDL) | Reqn | NAVICP : Philadelphia, PA | 0.061 | 0.098 | Oct 2015 | 0.099 | Oct 2016 | 0.099 | Oct 2017 | - | | 0.099 | 0.000 | 0.357 | - |
| | | **Subtotal** | 9.434 | 24.624 | | 47.647 | | 16.790 | | - | | 16.790 | - | - | - |

**Remarks**

Training Development: Contract Method is Goverment Purchase Card (GPC).

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | SS/CPFF | ARGON-1 : Fairfax, VA | 0.234 | 0.370 | Dec 2015 | 0.570 | Dec 2016 | 0.575 | Dec 2017 | - | | 0.575 | 0.000 | 1.749 | - |
| Software Development | SS/CPFF | L3 Communications : New York, NY | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| Development Support | WR | SSC PAC : San Diego, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| Software Development | SS/CPFF | ARGON-2 : Fairfax, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| Development Support | WR | NRL-1 : Washington, DC | 1.169 | 3.920 | Oct 2015 | 4.520 | Oct 2016 | 3.130 | Nov 2017 | - | | 3.130 | 0.000 | 12.739 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | Various | Classified-1 : Classified | 1.050 | 2.440 | Oct 2015 | 32.290 | Oct 2016 | 5.505 | Nov 2017 | - | | 5.505 | 0.000 | 41.285 | - |
| Studies & Analysis | WR | NRL-2 : Washington, DC | 1.654 | 0.340 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.994 | - |
| Software Development | SS/CPFF | ARL : University Park, PA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| Software Development | Various | Classified-2 : Classified | 0.000 | 2.420 | Jan 2016 | 4.100 | Jan 2017 | 1.468 | Jan 2018 | - | | 1.468 | 0.000 | 7.988 | - |
| Development Support | Various | Classified : Classified | 0.750 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.750 | - |
| Integrated Logistics Support (ILS) | Reqn | NAVICP : Philadelphia, PA | 0.046 | 0.074 | Oct 2015 | 0.075 | Dec 2016 | 0.075 | Dec 2017 | - | | 0.075 | 0.000 | 0.270 | - |
| Technical Data (Software Programs & Ref Materials) | Reqn | NPWC : Chesapeake, VA | 0.025 | 0.040 | Nov 2015 | 0.040 | Nov 2016 | 0.050 | Nov 2017 | - | | 0.050 | 0.000 | 0.155 | - |
| Studies & Analysis | MIPR | Classified : Classified | 0.000 | 0.628 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.628 | - |
| Comm'l Drivers Licenses (CDL) | Reqn | Classified : Classified | 0.009 | 0.041 | Jan 2016 | 0.000 | Jan 2017 | 0.045 | Jan 2018 | - | | 0.045 | 0.000 | 0.095 | - |
| | | **Subtotal** | 4.937 | 10.273 | | 41.595 | | 10.848 | | - | | 10.848 | 0.000 | 67.653 | - |

**Remarks**

CDL, ILS & Tech Data: Contract Method is Goverment Purchase Card (GPC).

CDLs are required for Command Personnel to drive Command Vehicles supporting the installation of mission hardware.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NAWC : China Lake, CA | 0.226 | 0.360 | Dec 2015 | 2.870 | Dec 2016 | 1.880 | Dec 2017 | - | | 1.880 | 0.000 | 5.336 | - |
| | | **Subtotal** | 0.226 | 0.360 | | 2.870 | | 1.880 | | - | | 1.880 | 0.000 | 5.336 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

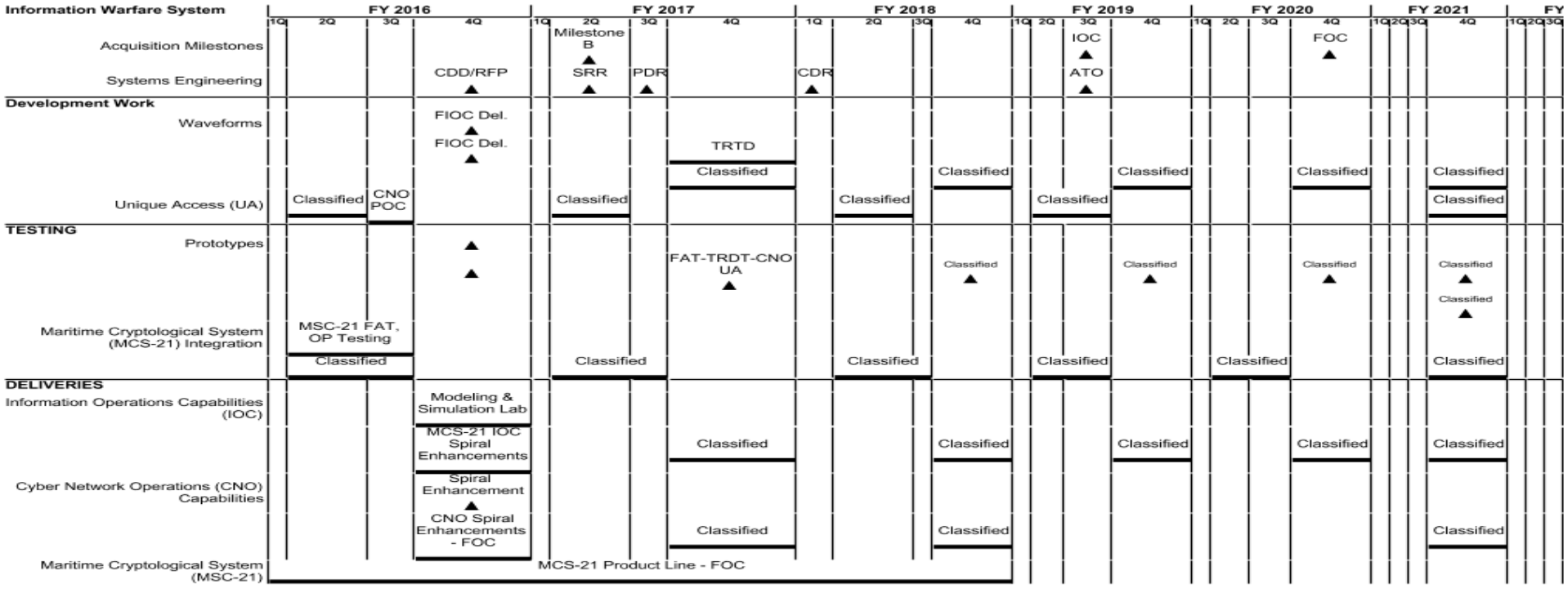
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Services | Various | Classified-2 : Classified | 0.480 | 0.850 | Nov 2015 | 0.950 | Dec 2016 | 0.498 | Dec 2017 | - | | 0.498 | 0.000 | 2.778 | - |
| Engineering & Develoment Services | Various | Classified-4 : Classified | 0.000 | 0.000 | | 3.256 | Dec 2016 | 1.278 | Dec 2017 | - | | 1.278 | 0.000 | 4.534 | - |
| Program Management Services | Various | Classified : Classified | 1.610 | 3.294 | Dec 2015 | 2.164 | Dec 2016 | 0.714 | Dec 2017 | - | | 0.714 | 0.000 | 7.782 | - |
| Contractor Engineering Services | Various | Classifed : Classified | 0.480 | 0.840 | Nov 2015 | 0.770 | Nov 2016 | 0.374 | Nov 2017 | - | | 0.374 | 0.000 | 2.464 | - |
| Program Analysis Services (Classified) | Various | Classified : Classified | 0.480 | 4.486 | Dec 2015 | 0.746 | Dec 2016 | 0.358 | Dec 2017 | - | | 0.358 | 0.000 | 6.070 | - |
| | | **Subtotal** | 3.050 | 9.470 | | 7.886 | | 3.222 | | - | | 3.222 | 0.000 | 23.628 | - |

| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 17.647 | 44.727 | | 99.998 | | 32.740 | | - | | 32.740 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

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| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Information Warfare System*** | | | | |
| Acquisition Milestones: Milestone B | 2 | 2017 | 2 | 2017 |
| Acquisition Milestones: IOC - Initial Operational Capability | 3 | 2019 | 3 | 2019 |
| Acquisition Milestones: FOC - Full Operational Capability | 4 | 2020 | 4 | 2020 |
| Systems Engineering: CDD/RFP APPROVAL (Capability Development Document / Request for Proposal) | 4 | 2016 | 4 | 2016 |
| Systems Engineering: SRR - SRR - System Requiements Review | 2 | 2017 | 2 | 2017 |
| Systems Engineering: PDR - Preliminary Design Review | 3 | 2017 | 3 | 2017 |
| Systems Engineering: CDR - Critical Design Review | 1 | 2018 | 1 | 2018 |
| Systems Engineering: ATO - Authorization to Operate | 3 | 2019 | 3 | 2019 |
| Development Work: Waveforms: 1-Waveforms | 4 | 2016 | 4 | 2016 |
| Development Work: Waveforms: 2-Waveforms | 4 | 2016 | 4 | 2016 |
| Development Work: Waveforms: 3 - Waveforms - Target Research & Technical Development (TRTD) | 4 | 2017 | 4 | 2017 |
| Development Work: Waveforms: 4- Waveforms - Classified | 4 | 2017 | 4 | 2017 |
| Development Work: Waveforms: 5 - Waveforms - Classified | 4 | 2018 | 4 | 2018 |
| Development Work: Waveforms: 6 - Waveforms - Classified | 4 | 2019 | 4 | 2019 |
| Development Work: Waveforms: 7 - Waveforms - Classified | 4 | 2020 | 4 | 2020 |
| Development Work: Waveforms: 8 - Waveforms - Classified | 4 | 2021 | 4 | 2021 |
| Development Work: Waveforms: 9 - Waveforms - Classified | 4 | 2022 | 4 | 2022 |
| Development Work: Unique Access (UA): 1 - Unique Access - Cyber Network Operations (CNO) - Proof of Concept (POC) | 3 | 2016 | 3 | 2016 |
| Development Work: Unique Access (UA): 2 - Unique Access - Classified | 2 | 2016 | 2 | 2016 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Development Work: Unique Access (UA): 3 - Unique Access - Classified | 2 | 2017 | 2 | 2017 |
| Development Work: Unique Access (UA): 4 - Unique Access - Classified | 2 | 2018 | 2 | 2018 |
| Development Work: Unique Access (UA): 5 - Unique Access | 2 | 2019 | 3 | 2019 |
| Development Work: Unique Access (UA): 6 - Unique Access | 2 | 2020 | 3 | 2020 |
| Development Work: Unique Access (UA): 7 - Unique Access | 2 | 2021 | 3 | 2021 |
| Development Work: Unique Access (UA): Intelligence Analysys & Determination of Vulnerabilities | 1 | 2016 | 4 | 2016 |
| Development Work: Unique Access (UA): Infrastructure Develop-MD-1 | 4 | 2016 | 4 | 2016 |
| Development Work: Unique Access (UA): Lab Develop-MC-2 | 1 | 2016 | 3 | 2016 |
| Development Work: Unique Access (UA): Systems Spec Refinement - TW | 1 | 2016 | 4 | 2016 |
| Development Work: Unique Access (UA): Systems Engineering - TW | 3 | 2016 | 3 | 2017 |
| Development Work: Unique Access (UA): Supposrt Systems Engineering - TW | 1 | 2017 | 3 | 2017 |
| Development Work: Unique Access (UA): Primary Compound Acquisition and Installation - TW | 4 | 2017 | 4 | 2018 |
| Development Work: Unique Access (UA): Secondary Compound Acquisition and Installation - TW | 2 | 2018 | 2 | 2019 |
| Development Work: Unique Access (UA): Subsystem Enhancement & Integration - TW | 4 | 2017 | 2 | 2018 |
| Development Work: Unique Access (UA): 1- Subsystem Enhancement & Intregration - TW | 4 | 2019 | 3 | 2020 |
| Development Work: Unique Access (UA): 2- Subsystem Enhancement & Intregration - TW | 4 | 2021 | 4 | 2021 |
| Development Work: Unique Access (UA): 3- Subsystem Enhancement & Intregration - TW | 4 | 2022 | 4 | 2022 |
| Development Work: Unique Access (UA): 8 - Unique Access | 4 | 2021 | 4 | 2021 |
| Development Work: Unique Access (UA): 9 - Unique Access | 4 | 2022 | 4 | 2022 |
| TESTING: Prototypes: 1-Prototypes | 4 | 2016 | 4 | 2016 |
| TESTING: Prototypes: 2-Prototypes | 4 | 2016 | 4 | 2016 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| TESTING: Prototypes: 3 - Prototypes - Factory Acceptance Testing (FAT), TRTD, CNO Unique Access | 4 | 2017 | 4 | 2017 |
| TESTING: Prototypes: 4 - Prototypes - Classified | 4 | 2018 | 4 | 2018 |
| TESTING: Prototypes: 5 - Prototypes - Classified | 4 | 2019 | 4 | 2019 |
| TESTING: Prototypes: 6 - Prototypes - Classified | 4 | 2020 | 4 | 2020 |
| TESTING: Prototypes: 7 - Prototypes - Classified | 4 | 2021 | 4 | 2021 |
| TESTING: Prototypes: 8 - Prototypes - Classified | 4 | 2021 | 4 | 2021 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 1 - MCS-21 Integration Factory Acceptance Testing (FAT), Operational Testing | 2 | 2016 | 3 | 2016 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 2 - MCS-21 Integration - Classified | 2 | 2016 | 3 | 2016 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 3 - MCS-21 Integration - Classified | 2 | 2017 | 3 | 2017 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 4 - MCS-21 Integration - Classified | 2 | 2018 | 3 | 2018 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 5 - MCS-21 Integration - Classified | 2 | 2019 | 3 | 2019 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 6 - MCS-21 Integration | 2 | 2020 | 3 | 2020 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 7 - MCS-21 Integration | 4 | 2021 | 4 | 2021 |
| TESTING: Maritime Cryptological System (MCS-21) Integration: 8 - MCS-21 Integration | 4 | 2022 | 4 | 2022 |
| DELIVERIES: Information Operations Capabilities (IOC): Information Operations Capabilities (IOC) Modeling & Simulation Lab | 4 | 2016 | 4 | 2016 |
| DELIVERIES: Information Operations Capabilities (IOC): 1 - MCS-21 IOC - Spiral Enhancements | 4 | 2016 | 4 | 2016 |
| DELIVERIES: Information Operations Capabilities (IOC): 2 - MCS-21 IOC - Classified | 4 | 2017 | 4 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| DELIVERIES: Information Operations Capabilities (IOC): 3 - MCS-21 IOC - Classified | 4 | 2018 | 4 | 2018 |
| DELIVERIES: Information Operations Capabilities (IOC): 4 - MCS-21 IOC - Classified | 4 | 2019 | 4 | 2019 |
| DELIVERIES: Information Operations Capabilities (IOC): 5 - MCS-21 IOC - Classified | 4 | 2020 | 4 | 2020 |
| DELIVERIES: Information Operations Capabilities (IOC): 6 - MCS-21 IOC - Classified | 4 | 2021 | 4 | 2021 |
| DELIVERIES: Information Operations Capabilities (IOC): 7 - MCS-21 IOC - Classified | 4 | 2022 | 4 | 2022 |
| DELIVERIES: Information Operations Capabilities (IOC): 1 - TW - Component Acceptance | 2 | 2017 | 3 | 2017 |
| DELIVERIES: Information Operations Capabilities (IOC): 2 - TW - Component Acceptance | 3 | 2018 | 4 | 2018 |
| DELIVERIES: Information Operations Capabilities (IOC): 3 - TW Component Acceptance | 4 | 2019 | 1 | 2020 |
| DELIVERIES: Information Operations Capabilities (IOC): 1 - TW - Integrated System Evaluation | 2 | 2019 | 3 | 2019 |
| DELIVERIES: Information Operations Capabilities (IOC): 2 - TW - Integrated System Evaluation | 3 | 2020 | 2 | 2021 |
| DELIVERIES: Information Operations Capabilities (IOC): MC - Testing CNO for Model Simulation - 1 | 4 | 2016 | 1 | 2018 |
| DELIVERIES: Information Operations Capabilities (IOC): MC - Intelligence Analysis of Tech Vulnerables - 2 | 2 | 2016 | 1 | 2019 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 1-CNO Capabilities - Spiral Enhancements | 4 | 2016 | 4 | 2016 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 2-CNO Capabilities - Spiral Enhancements / Full Operational Capability (FOC) | 4 | 2016 | 4 | 2016 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 3 -CNO Capabilities - Classified | 4 | 2017 | 4 | 2017 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 4 - CNO Capabilities - Classified | 4 | 2018 | 4 | 2018 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 5 - CNO Capabilities | 4 | 2019 | 4 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>2263 / *Information Warfare System* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 6 - CNO Capabilities | 4 | 2021 | 4 | 2021 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: 7- CNO Capabilities | 4 | 2022 | 4 | 2022 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: TW - Function Classified - 1 | 1 | 2018 | 4 | 2019 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: TW - Function Classified - 2 | 4 | 2019 | 2 | 2020 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: TW - Function Classified - 3 | 4 | 2020 | 4 | 2020 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: TW - Function Classified - 4 | 4 | 2021 | 4 | 2021 |
| DELIVERIES: Cyber Network Operations (CNO) Capabilities: TW - Function Classified - 5 | 4 | 2022 | 4 | 2022 |
| DELIVERIES: Maritime Cryptological System (MSC-21): 6 - CNO Capabilities | 4 | 2020 | 4 | 2020 |
| DELIVERIES: Maritime Cryptological System (MSC-21): MCS-21 Product Line - Full Operational Capability (FOC) | 1 | 2016 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0204575N / *Elect Warfare Readiness Supt* | Project (Number/Name)<br>3426 / *Maritime Cyber* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3426: *Maritime Cyber* | 0.000 | 0.000 | 0.000 | 18.300 | - | 18.300 | 20.400 | 20.500 | 20.900 | 21.300 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Mocking Jay: Funds were realigned from project code 2263 Information Warfare Systems to 3426 Maritime Cyber to reflect additional development and testing of networks for vulnerability analysis, reverse engineering, simulation systems, and closed development networks. Additionally, this project funds Cyber Foundry, Cyber Infrastructure and the Research and Development Site to support the Navy's portion of USCYBERCOM planned Unified Platform and Cyber Mission Force. Details held at a higher classification.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Mocking Jay | 0.000 | 0.000 | 18.300 | 0.000 | 18.300 |
| ***Articles:*** | - | - | - | - | - |

***Description:*** Analytical and engineering effort to develop cyber capabilities in the maritime domain. Produces Cyber capabilities to meet Navy cyber requirements. Increased funding provides physical space for Cyber Research & Development team. Enables development of new operating systems to ensure access and cyber weapons delivery. Provides Navy contribution to the USCYBERCOM planned Unified Platform and Cyber Mission Force(Details held at a higher classification level). Funds realigned from project code 2263.

***FY 2016 Accomplishments:***
N/A

***FY 2017 Plans:***
N/A

***FY 2018 Base Plans:***
Starting in FY18, Mocking Jay moved from project code 2263 Information Warfare Systems to project code 3426 Maritime Cyber.

*Further development of intelligence analysis to determine specific technical vulnerabilities for Computer Network Operations
*Further fund specialized information technology and exploitation capabilities in order to create a premier Navy Cyberspace development capability
*Further fund the Cyber Infrastructure to support technical Research & Development of the Navy portion of the

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>3426 / *Maritime Cyber* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| USCYBERCOM planned Unified Platform (Details held at a higher classification level)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 18.300 | 0.000 | 18.300 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is part of a designated Acquisition Category 3 (ACAT III) and non-ACAT and operate under streamlined acquisition. The non-ACAT designation supports a streamlined acquisition process using the Advanced Concept Technology Demonstration documentation of the Defense Acquisition Guidance.

**E. Performance Metrics**

Measures include quality and impact of new ideas and approaches, the success of the technology and Cyber application in satisfying Combatant Commanders and Fleet requirements, and successful cost effective transition of the capability into operational systems. The goal of these investments is to provide to Commanders non-kinetic options to influence adversaries and prevent escalation of crises. Due to the nature and classification of these efforts, qualitative measures are used. It is the intent through the development of modeling and simulation scenarios and capabilities to develop quantitative metrics. The success of this depends heavily on the insight obtained via various intelligence community efforts.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>3426 / *Maritime Cyber* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | Various | Classified : Classified | 0.000 | 0.000 | | 0.000 | | 3.300 | Nov 2017 | - | | 3.300 | Continuing | Continuing | Continuing |
| System Engineering | SS/CPFF | Applied Research Laboratory : University Park, PA | 0.000 | 0.000 | | 0.000 | | 5.000 | Dec 2017 | - | | 5.000 | 0.000 | 5.000 | - |
| System Engineering | WR | Naval Research Laboratory : Washington, DC | 0.000 | 0.000 | | 0.000 | | 5.000 | Oct 2017 | - | | 5.000 | 0.000 | 5.000 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 13.300 | | - | | 13.300 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | WR | Naval Research Laboratory : Washington, DC | 0.000 | 0.000 | | 0.000 | | 2.000 | Nov 2017 | - | | 2.000 | 0.000 | 2.000 | - |
| Development Support | Various | Classified : Classified | 0.000 | 0.000 | | 0.000 | | 2.000 | Nov 2017 | - | | 2.000 | 0.000 | 2.000 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 4.000 | | - | | 4.000 | 0.000 | 4.000 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Need Item Text | C/BA | Not Specified : Not Specified | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>3426 / *Maritime Cyber* |

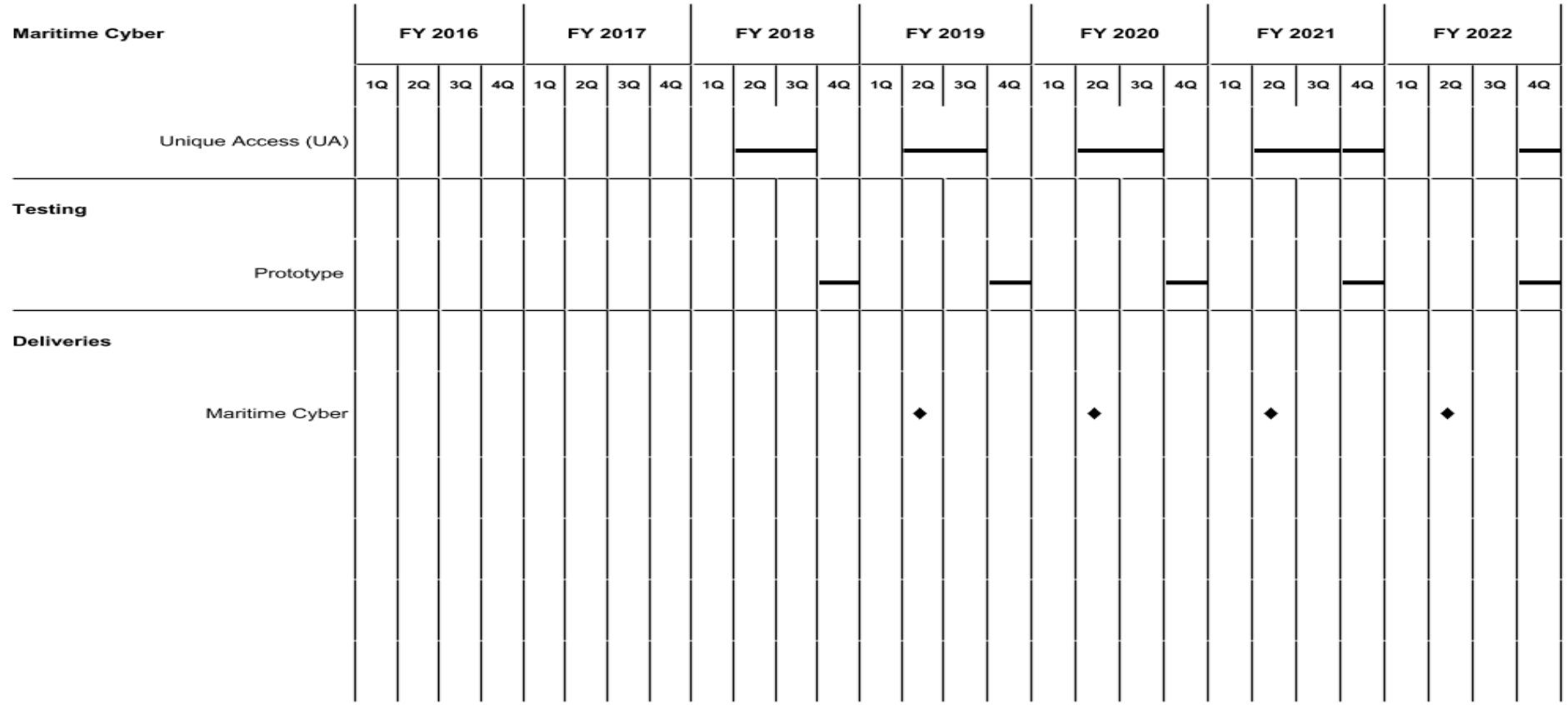
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering and Development Services | Various | Classified-4 : Classified | 0.000 | 0.000 | | 0.000 | | 0.500 | Dec 2017 | - | | 0.500 | 0.000 | 0.500 | - |
| Program Management Services | Various | Classified : Classified | 0.000 | 0.000 | | 0.000 | | 0.500 | Dec 2017 | - | | 0.500 | 0.000 | 0.500 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 1.000 | | - | | 1.000 | 0.000 | 1.000 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 18.300 | | - | | 18.300 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>3426 / *Maritime Cyber* |




*2018PB - 0204575N - 3426*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0204575N / *Elect Warfare Readiness Supt* | **Project (Number/Name)**<br>3426 / *Maritime Cyber* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Maritime Cyber*** | | | | |
| Unique Access (UA): 4 - Unique Access | 2 | 2018 | 3 | 2018 |
| Unique Access (UA): 5 - Unique Access | 2 | 2019 | 3 | 2019 |
| Unique Access (UA): 6 - Unique Access | 2 | 2020 | 3 | 2020 |
| Unique Access (UA): 7 - Unique Access | 2 | 2021 | 3 | 2021 |
| Unique Access (UA): 8 - Unique Access | 4 | 2021 | 4 | 2021 |
| Unique Access (UA): 9 - Unique Access | 4 | 2022 | 4 | 2022 |
| Testing: Prototype: 4 - Prototype - Classified | 4 | 2018 | 4 | 2018 |
| Testing: Prototype: 5 - Prototype - Classified | 4 | 2019 | 4 | 2019 |
| Testing: Prototype: 6 - Prototype - Classified | 4 | 2020 | 4 | 2020 |
| Testing: Prototype: 7 - Prototype - Classified | 4 | 2021 | 4 | 2021 |
| Testing: Prototype: 8 - Prototype - Classified | 4 | 2022 | 4 | 2022 |
| Deliveries: Maritime Cyber: 4 - MJ | 2 | 2019 | 2 | 2019 |
| Deliveries: Maritime Cyber: 5 - MJ | 2 | 2020 | 2 | 2020 |
| Deliveries: Maritime Cyber: 6 - MJ | 2 | 2021 | 2 | 2021 |
| Deliveries: Maritime Cyber: 7 - MJ | 2 | 2022 | 2 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 750.899 | 28.063 | 48.635 | 87.989 | - | 87.989 | 115.055 | 117.180 | 78.571 | 62.396 | Continuing | Continuing |
| 1780: *HARM Improvement* | 48.994 | 1.383 | 1.347 | 6.408 | - | 6.408 | 6.409 | 7.406 | 7.434 | 7.463 | Continuing | Continuing |
| 2185: *AARGM* | 701.905 | 17.468 | 4.237 | 15.249 | - | 15.249 | 7.927 | 9.034 | 7.528 | 5.029 | Continuing | Continuing |
| 2189: *AARGM ER* | 0.000 | 9.212 | 43.051 | 66.332 | - | 66.332 | 100.719 | 100.740 | 63.609 | 49.904 | Continuing | Continuing |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 368 | | | | | | | | | | | | |

**Note**

Project unit 2189 is established for the Anti-Radiation Guided Missile (AARGM) Extended Range (ER) developmental effort and was a new start in FY 2016.

**A. Mission Description and Budget Item Justification**

Research, Development, Test and Evaluation funding for the Joint Service Anti-Radiation Missile (ARM) program, which will include near and far term performance improvements, cost reduction, and studies that establish future development requirements. Specific initial efforts include lower cost seeker component development and seeker aided fuzing to enhance warhead performance in low angle impacts and against certain ship targets.

JUSTIFICATION FOR BUDGET ACTIVITY: These projects are funded under Operational Systems Development because they include development efforts to upgrade systems that have been fielded or have received approval for full-rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 23.708 | 48.635 | 83.573 | - | 83.573 |
| Current President's Budget | 28.063 | 48.635 | 87.989 | - | 87.989 |
| Total Adjustments | 4.355 | 0.000 | 4.416 | - | 4.416 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 4.600 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.246 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 5.276 | - | 5.276 |
| • Rate/Misc Adjustments | 0.001 | 0.000 | -0.860 | - | -0.860 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205601N *I Harm Improvement* |

**Change Summary Explanation**

FY 2018 funding increase to Proj. 1780 HARM Improvement to support HARM/AARGM Foreign Material Assessment (FMA) to maximize HARM/AARGM effectiveness against threat air defense systems.

FY 2018 funding increase to Proj. 2185 AARGM to support the implementation of M Code and upgrades to the radio frequency data processing to meet emerging requirements.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>1780 / *HARM Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1780: *HARM Improvement* | 48.994 | 1.383 | 1.347 | 6.408 | - | 6.408 | 6.409 | 7.406 | 7.434 | 7.463 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Anti-Radiation Missile (ARM) Improvement is a combination of the Navy led High Speed Anti-Radiation Missile (HARM) program and the Advanced Anti-Radiation Guide Missile (AARGM) program. The HARM program has undergone several Engineering Change Plans since ceasing production in 1983. Currently, the inventory consists of AGM-88B/C missiles with Block 5/A software which provides increased capability tracking emitters, improved targeting against a larger set of air defense related systems and improved seeker. HARM is a Navy led joint service program with the United States Air Force. AARGM is a program derived from a Small Business Innovative Research (SBIR) program that developed a dual mode guidance section, incorporating a Millimeter Wave (MMW) radar with an advance anti-radiation homing seeker. This provides the capability to counter shutdown of emitters. Additional capability for AARGM consists of Global Positioning System capability, MMW terminal guidance, netted targeting real time feed via Integrated Broadcast System (IBS), Weapon Impact Assessment (WIA), GPS point-to-point weapon engagement and impact avoidance zone/missile impact zones.

ARM Improvement efforts require periodic updates to the user data base based on changing threat parameters, enhanced air defense engagement tactics and emerging systems. These funds provide the opportunity to conduct ground and flight testing against foreign systems, called Foreign Material Assessment (FMA). The result of FMA is an analytical report on findings, updates to fleet tactics manuals, curriculum changes to the Suppression of Enemy Air Defenses / Destruction of Enemy Air Defenses lead Air Combat Training Curriculum course work and weapon school tactics/training and procedure briefs. FMA is focused on air defense weapon system and non-traditional target exploitation, analysis and subsequent integration and response to ensure the AGM-88 ARM weapon systems remains relevant in the planned operational environment.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** ARM Foreign Material Assessment (FMA) | 1.383 | 1.347 | 6.408 | 0.000 | 6.408 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>The FMA team conducted FMA analysis and engineering against threat weapon systems in FY 2016. Focus was on new threat systems as they become available as well as theater/country-specific systems of interest, with priorities coordinated through the Fleet Anti-Radiation Missile (ARM) Steering Committee. Testing and evaluation continued on advanced Surface-to-Air weapons and related Integrated Air Defense System, jammers and ARM countermeasures, and non-traditional ARM targets. Team continued to support Fleet engagement as a key element of engineering and analytical efforts, which included funding for threat assessment, operational updates and integration efforts. Additional test priorities included characterizing complex systems in the field, so that the 5A attenuation and Lower Threshold Adjust fields can be populated with the data that gives the best | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>1780 / *HARM Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| track quality to the High-speed Anti-Radiation Missile (HARM) missile. The FMA team conducted developmental tests of in-country foreign threat systems via ground and flight test to maximize HARM system performance. Focus was on any system not previously tested by the FMA team. Non-traditional targeting methods were explored as well.<br>***FY 2017 Plans:***<br>The FMA team will continue to conduct FMA analysis and engineering against threat weapon systems in FY 2017. Focus will be on new threat systems as they become available as well as theater/country-specific systems of interest, with priorities coordinated through the Fleet ARM Steering Committee. Expect continued testing on advanced Surface-to-Air weapons and related Integrated Air Defense System (IADS), jammers and ARM countermeasures, and non-traditional ARM targets. Team will continue to support Fleet engagement as a key element of engineering and analytical efforts, which includes funding for threat assessment, operational updates and integration efforts. Additional test priorities include characterizing complex systems in the field, so that the 5A attenuation and Lower Threat Adjust fields can be populated with the data that gives the best track quality to the HARM)missile. The FMA team will continue to conduct developmental test of in-country foreign threat systems via ground and flight test in FY 2017 to maximize HARM system performance. Non-traditional targeting methods will be explored as well.<br>***FY 2018 Base Plans:***<br>FMA activities will expand to include the AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) in addition to the AGM-88B/C High-speed Anti-Radiation Missile (HARM). Increased funding will allow for FMA lab, ground, and flight test and evaluation activities to expand across the entire AGM-88 family of missiles to evaluate new and modern threat systems in order to update HARM and AARGM with capability to counter these threats. The funding also supports enhancement/upgrade to existing lab facilities to support the analysis of FMA results. The FMA team will continue to conduct FMA testing (both ground-based and captive flight testing), data analysis, and systems engineering to maximize AARGM and HARM effectiveness against threat air defense systems in FY 2018. The expanded capabilities of the AARGM from the legacy HARM will take advantage of the additional lab capabilities to compliment already existing HARM lab capabilities. This will enable digital Anti-Radiation Homing (ARH) seeker and MilliMeter Wave (MMW) terminal seeker assessment which are unique capabilities to AARGM. FMA assessments will remain focused on new threat systems as they become available for evaluation as well as theater/country-specific systems of interest. Priorities coordinated through the Fleet ARM Steering Committee. Expect continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, and ARM countermeasures, and non-traditional ARM targets. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, operational updates, and integration efforts. Additional test priorities include characterizing complex systems in the field, so | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>1780 / *HARM Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| that FMA assessments can directly populate missile threat data libraries with updated attributes to enhance track quality for HARM and AARGM.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.383 | 1.347 | 6.408 | 0.000 | 6.408 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

ARM system updates are provided through the System Support Activity (SSA) at Naval Air Warfare Center - Weapons Division (NAWCWD), China Lake, CA. ARM fleet priorities are set by the Fleet ARM Steering Committee.

**E. Performance Metrics**

Continue FMA testing and engineering analysis against new and evolving foreign threats.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | | | | Project (Number/Name)<br>2185 / *AARGM* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2185: *AARGM* | 701.905 | 17.468 | 4.237 | 15.249 | - | 15.249 | 7.927 | 9.034 | 7.528 | 5.029 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 368

**A. Mission Description and Budget Item Justification**

Advanced Anti-Radiation Guided Missile (AARGM) transitioned a Phase III Small Business Innovative Research (SBIR) program to develop and demonstrate a multi-mode guidance section on a High Speed Anti-Radiation Missile (HARM) airframe to System Development and Demonstration (SD&D) in FY 2003. The AARGM SD&D program was designed to integrate multi-mode guidance (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) Radar/Global Positioning System (GPS)/ Inertial Navigation System) on the HARM Air-to-Ground Missile (AGM)-88. Planned AARGM weapon system capabilities include: active MMW terminal guidance, counter shutdown, expanded threat coverage, enhanced ARH, netted targeting real-time feed via Integrated Broadcast System (IBS) prior to missile launch, Weapon Impact Assessment (WIA) transmitted prior to detonation, GPS/point-to-point weapon navigation, enhanced navigational performance in denied environments and weapon employment with impact avoidance zone/missile impact zones.

The AARGM program includes 40 SD&D test articles with the follow on of 2,435 production modification kits. Milestone C was achieved 4Q FY 2008, followed by a combined FY 2008/FY 2009 Low Rate Initial Production (LRIP) contract award in 1Q FY 2009. Developmental testing was completed in 2009. Initial Operational Test and Evaluation (IOT&E) was completed in 3Q FY 2012. Full-Rate Production (FRP) decision was received 4 September 2012 with FRP contract award on 10 September 2012, and deliveries began in January 2014. The program remains in production through FY 2023.

The AARGM Block 1 Upgrade program began in FY 2012 and consists of a software only upgrade to deferred Key Performance Parameter 3 and to correct IOT&E deficiencies in the AGM-88E All-Up-Round as well as the Common Munitions Built-in Test (BIT) Reprogramming Equipment (CMBRE). In parallel with the Block 1 Upgrade, Integrated Broadcast Service (IBS)-R developmental efforts are ongoing.

Follow-on Operational Test and Evaluation/Integrated Test (FOT&E/IT) is ongoing in conjunction with Block 1 Upgrade and is scheduled to complete in FY 2017.

In FY 2016 - FY 2022, the AARGM program plans to develop and demonstrate the capability to engage and destroy non-traditional and Overseas Contingency Operations targets. These developments continue Future Naval Capability Science and Technology investments by the Office of Naval Research initiated in FY 2006. Over this same timeframe, the AARGM program will develop or enhance navigational capability in denied environments.

FY 2018 funding increased as a result of efforts supporting AARGM's advanced development and system capability upgrades. Additional funding will support the implementation of M Code and upgrades to the radio frequency data processing to meet emerging requirements.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2185 / *AARGM* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Threat Data Library / System Updates | 1.788 | 2.210 | 2.230 | 0.000 | 2.230 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>AGM-88E Block 1 Upgrade continued effort to update Electronic Intelligence files and Millimeter Wave (MMW) signatures to identify track and engage new and/or improved threat radars. Continued test and assessment of threat systems to include characterization of AARGM Millimeter Wave and Anti-Radiation Homing (ARH) subsystems. Developed threat data for new target sets. | | | | | |
| ***FY 2017 Plans:***<br>AGM-88E Block 1 Upgrade continues effort to update Electronic Intelligence files and Millimeter Wave signatures to identify track and engage new and/or improved threat radars. Continue test and assessment of threat systems. Develop threat data for new target sets. | | | | | |
| ***FY 2018 Base Plans:***<br>AGM-88E Block 1 Upgrade continues effort to upgrade systems such as the Electronic Intelligence files and Millimeter Wave signatures to identify, track and engage new and/or improved threat radars. Continue test and assessment of threat systems that impact already fielded weapons and to develop threat data for new target sets. Plans also include development or enhancement of navigational capability, integration of modernized Anti-Radiation Homing processor, and human system interface improvements to mission planning. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Follow-on Operational Test and Evaluation (FOT&E) and Correction of Deficiencies | 13.990 | 1.077 | 0.475 | 0.000 | 0.475 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued FOT&E, including Integrated Test (IT) and Operational Test (OT) for Advanced Anti-Radiation Guided Missile (AARGM) Block 1 utilizing Commander Operational Test & Evaluation Force (COMOPTEVFOR) requirements for suitable and effective for desired flights, targets and locations. Design improvements for the telemetry sections support data collection efforts on test events and for non-combat expenditure events. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2185 / *AARGM* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete FOT&E, including IT and OT for AARGM Block 1 utilizing COMOPTEVFOR requirements for suitable and effective for desired flights, targets, and locations. Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies.<br>***FY 2018 Base Plans:***<br>Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies. Testing for those efforts in System Updates includes navigational T&E, processor performance evaluations, and includes verification and validation for correction of deficiencies from Block 0 and Block 1 testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Advanced Development | 1.690 | 0.950 | 12.544 | 0.000 | 12.544 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued support for advanced development, analysis activities of testing, configuration control board review, test plan reviews, requirements analysis and weapons integration analysis.<br>***FY 2017 Plans:***<br>Continue support for advanced development, systems capability upgrades, analysis activities and testing such as the Integrated Broadcast Service - Receiver. Funding supports testing, configuration control board review, test plan reviews, requirements analysis and weapons integration analysis. Funding also supports the Anti-Radiation Missile (AARGM) Derivative Program to include upgrading the AGM-88E capability against non-traditional and Overseas Contingency Operations (OCO) targets, weapon system developmental activities, range and laboratory support and analysis.<br>***FY 2018 Base Plans:***<br>Enhance navigational capability to comply with requirement to implement M Code to comply with U.S. Statute. Funding added in PB18 specifically addresses the effort to upgrade radio frequency data processing to meet emerging requirements. Funding also supports the transition of receiver technology upgrades in coordination with the Office of Naval Research (ONR). This project was initiated in FY 2016 which upgrades the AARGM capability for detection of high priority, non-traditional targets. The Technology Transition Agreement (TTA) requires the program to fund the integration of the design which consists of software development and hardware integration. Funding also provides continued support for advanced development, upgrades systems capability, analysis activities and testing such as the Integrated Broadcast Service - Receiver. Funding supports testing, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2185 / *AARGM* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| configuration control board review, test plan reviews, requirements analysis and weapons integration analysis. Funding also supports upgrading AGM-88E capability against non-traditional and OCO targets. This includes weapon system developmental activities, range and laboratory support and analysis.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 17.468 | 4.237 | 15.249 | 0.000 | 15.249 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN 2327: *HARM Mods* | 120.798 | 178.213 | 183.368 | - | 183.368 | 190.029 | 185.905 | 190.051 | 177.449 | 188.285 | 1,945.791 |

**Remarks**

FY 2021 and FY 2022 Total Cost funding listed does not include the Advanced Anti-Radiation Guided Missile Extended Range funding.

**D. Acquisition Strategy**

The AARGM program started as a Phase I Small Business Innovative Research (SBIR), Advanced Technology Program, evolved into a Phase III SBIR program, and transitioned into a System Development and Demonstration (SD&D) Acquisition Category 1C program in June 2003. The AARGM SD&D fulfills U.S. Navy operational requirements and incorporates AARGM Advanced Technology Development and Quick Bolt Advanced Concept Technology Demonstration - demonstrated system requirements. Block 1 Fleet Release anticipated for 3Q FY 2017. Expand target set capability in FY 2017 - FY2022.

**E. Performance Metrics**

Block 1 Fleet Release scheduled for 3Q FY 2017.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2185 / *AARGM* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | SS/CPFF | Orbital ATK : Northridge, CA | 0.000 | 0.000 | | 0.000 | | 9.500 | Nov 2017 | - | | 9.500 | 0.000 | 9.500 | - |
| Systems Engineering | WR | NAWCWD : China Lake, CA | 75.355 | 6.965 | Nov 2015 | 2.012 | Nov 2016 | 2.055 | Nov 2017 | - | | 2.055 | Continuing | Continuing | Continuing |
| M Code | SS/IDIQ | Orbital ATK : Northridge, CA | 0.000 | 0.000 | | 0.000 | | 1.000 | Jan 2018 | - | | 1.000 | 0.000 | 1.000 | - |
| Software Development | WR | SPAWAR : San Diego, CA | 0.569 | 0.324 | Mar 2016 | 0.050 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Software Development | SS/IDIQ | Orbital ATK : Northridge, CA | 0.000 | 0.000 | | 0.000 | | 1.026 | Mar 2018 | - | | 1.026 | 0.000 | 1.026 | - |
| Mission Planning | WR | Various : Various | 0.633 | 0.100 | Mar 2016 | 0.100 | Mar 2017 | 0.100 | Mar 2018 | - | | 0.100 | Continuing | Continuing | Continuing |
| Prior year Prod Dev no longer funded in the FYDP | Various | Various : Various | 543.386 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 543.386 | - |
| | | **Subtotal** | 619.943 | 7.389 | | 2.162 | | 13.681 | | - | | 13.681 | - | - | - |

**Remarks**

FY 2018 Primary Hardware Development funding planned for the Radio Frequency data processing upgrade. FY 2018 M Code funding required to support implementation of M Code. FY 2018 Software Development funding planned to support the transition of ONR upgrades.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior year Support no longer funded in the FYDP | Various | Various : Various | 7.147 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.147 | - |
| | | **Subtotal** | 7.147 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.147 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Test & Evaluation | WR | NAWCWD : China Lake, CA | 26.433 | 0.000 | | 0.000 | | 0.528 | Nov 2017 | - | | 0.528 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2185 / *AARGM* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Test & Evaluation | SS/IDIQ | Orbital ATK : Northridge, CA | 5.441 | 0.298 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.739 | 5.739 |
| Development Test & Evaluation | WR | JITC : Fort Huachuca, AZ | 0.000 | 0.000 | | 0.006 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.006 | - |
| Operational and Integrated Test & Evaluation (IT&OT)) | WR | NAWCWD : China Lake, CA | 5.997 | 6.717 | Nov 2015 | 0.648 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational and Integrated Test & Evaluation (IT&OT)) | WR | COMOPTEVFOR : Norfolk, VA | 11.235 | 0.435 | Nov 2015 | 0.190 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational and Integrated Test & Evaluation (IT&OT)) | SS/IDIQ | Orbital ATK : Northridge, CA | 0.000 | 1.342 | Jun 2016 | 0.291 | Feb 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Prior year T&E no longer funded in the FYDP | Various | Various : Various | 7.469 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.469 | - |
| | | **Subtotal** | 56.575 | 8.792 | | 1.135 | | 0.528 | | - | | 0.528 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | Various | Various : Various | 4.556 | 0.284 | Feb 2016 | 0.175 | Feb 2017 | 0.250 | Feb 2018 | - | | 0.250 | Continuing | Continuing | Continuing |
| Travel | WR | NAVAIR HQ : Patuxent River, MD | 1.714 | 0.024 | Feb 2016 | 0.025 | Feb 2017 | 0.015 | Feb 2018 | - | | 0.015 | Continuing | Continuing | Continuing |
| Government Engineering Support | WR | NAWC AD : Patuxent River, MD | 1.520 | 0.679 | Nov 2015 | 0.440 | Nov 2016 | 0.575 | Nov 2017 | - | | 0.575 | Continuing | Continuing | Continuing |
| Program Management Support | Various | NRO : Washington, D.C. | 0.200 | 0.300 | Nov 2015 | 0.300 | Nov 2016 | 0.200 | Nov 2017 | - | | 0.200 | Continuing | Continuing | Continuing |
| Prior year Mgmt no longer funded in the FYDP | Various | Various : Various | 10.250 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.250 | - |
| | | **Subtotal** | 18.240 | 1.287 | | 0.940 | | 1.040 | | - | | 1.040 | - | - | - |

**Remarks**

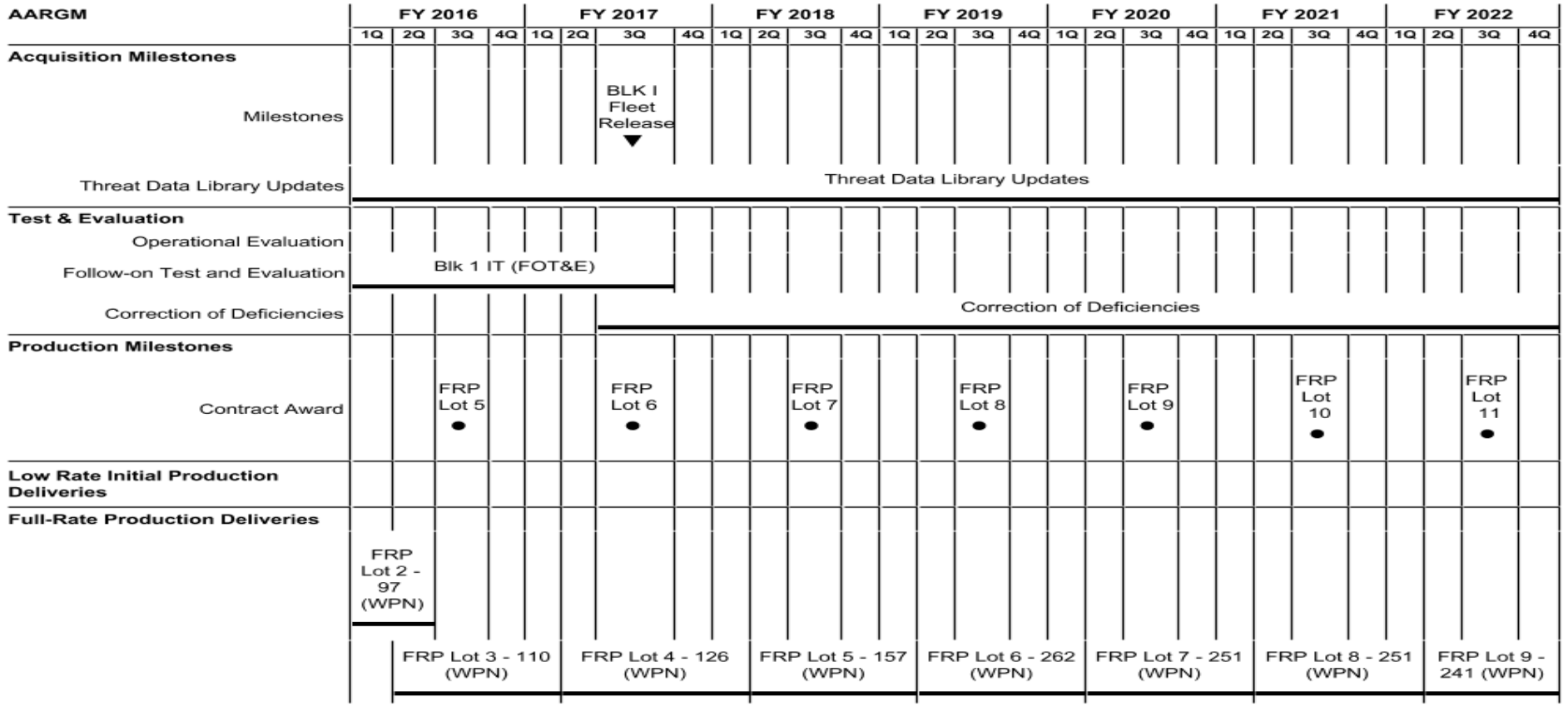
Contract Type for Travel is TO

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2185 / *AARGM* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 701.905 | 17.468 | | 4.237 | | 15.249 | | - | | 15.249 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2185 / *AARGM* |




*2018PB - 0205601N - 2185*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2185 / *AARGM* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***AARGM*** | | | | |
| Acquisition Milestones: Milestones: BLOCK 1 Fleet Release | 3 | 2017 | 3 | 2017 |
| Acquisition Milestones: Threat Data Library Updates: Threat Data Library Updates | 1 | 2016 | 4 | 2022 |
| Test & Evaluation: Follow-on Test and Evaluation: Block 1 IT (FOT&E) | 1 | 2016 | 3 | 2017 |
| Test & Evaluation: Correction of Deficiencies: Correction of Deficiencies | 3 | 2017 | 4 | 2022 |
| Production Milestones: Contract Award: Full-Rate Production Lot 5 | 3 | 2016 | 3 | 2016 |
| Production Milestones: Contract Award: Full-Rate Production Lot 6 | 3 | 2017 | 3 | 2017 |
| Production Milestones: Contract Award: Full-Rate Production Lot 7 | 3 | 2018 | 3 | 2018 |
| Production Milestones: Contract Award: Full-Rate Production Lot 8 | 3 | 2019 | 3 | 2019 |
| Production Milestones: Contract Award: Full-Rate Production Lot 9 | 3 | 2020 | 3 | 2020 |
| Production Milestones: Contract Award: Full-Rate Production Lot 10 | 3 | 2021 | 3 | 2021 |
| Production Milestones: Contract Award: Full-Rate Production Lot 11 | 3 | 2022 | 3 | 2022 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 2 (WPN) | 1 | 2016 | 2 | 2016 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 3 (WPN) | 2 | 2016 | 1 | 2017 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 4 (WPN) | 2 | 2017 | 1 | 2018 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 5 (WPN) | 2 | 2018 | 1 | 2019 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 6 (WPN) | 2 | 2019 | 1 | 2020 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 7 (WPN) | 2 | 2020 | 1 | 2021 |
| Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 8 (WPN) | 2 | 2021 | 1 | 2022 |
| Full-Rate Production Deliveries: Full-Rate Production Delieveries - Lot 9 (WPN) | 2 | 2022 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2189 / *AARGM ER* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2189: *AARGM ER* | 0.000 | 9.212 | 43.051 | 66.332 | - | 66.332 | 100.719 | 100.740 | 63.609 | 49.904 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Air-to-Ground (AGM)-88E Extended Range (ER) Upgrade was a new start in FY 2016. The purpose of this effort is to develop hardware and software modifications to improve the Advanced Anti-Radiation Guided Missile (AARGM)'s operational capabilities, including extended range, survivability and effectiveness against complex, new, and emerging threats. This budget line item funds a new rocket motor design, system development and integration, test asset procurement, testing, and associated software updates for the AARGM-ER to ensure these capabilities perform in accordance with established requirements. FY 2018 activities include entry into the Engineering Manufacturing and Design (EMD) phase. Procurement of test articles will begin in FY 2019. AARGM-ER retains the same guidance, sensor, and warhead capabilities of the Block 1 AARGM.

The AARGM-ER program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that push engagement distances beyond the launch platform's radar horizon and allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more scenarios require compressed and coordinated fire control timelines.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** AARGM ER Development | 9.212 | 43.051 | 66.332 | 0.000 | 66.332 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Began the developmental effort for the AARGM-ER upgrade to include award of the AARGM pre-Front End Design Analysis (pre-FEDA) contract, development of technical requirements specifications, and documentation to satisfy mandatory DoD 5000.2 entry criteria. Executed analyses for F/A-18 and F-35 aircraft integration. Initiated analysis for telemetry section Flight Termination System development. Developed data analyses to support lead system integration trade decisions. | | | | | |
| ***FY 2017 Plans:***<br>Continue the AARGM-ER developmental efforts to include award of the Front End Design Analysis (FEDA) contract, award of the Missile Section Integration contract, and initiation of a Rocket Motor Risk Initiative. Continue analyses for F/A-18 and F-35C aircraft integration. Continue range safety analysis for telemetry section Flight Termination System development. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2189 / *AARGM ER* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Completion of the Front End Design Analysis and Missile Section Integration contracts. Completion of the Rocket Motor Risk Initiative. Execution of Milestone B and contract award for the Engineering & Manufacturing Development phase.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 9.212 | 43.051 | 66.332 | 0.000 | 66.332 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The AARGM Extended Range Program will provide hardware and software modifications to improve AARGM's operational capabilities, including extended range, survivability, and effectiveness against complex, new, emerging threats. The program's threshold requirement for Initial Operational Capability is FY 2023.

**E. Performance Metrics**

AARGM-ER activities to support a Milestone B in FY 2018.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2189 / *AARGM ER* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rocket Motor Risk Initiative | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 3.608 | Jan 2017 | 3.680 | Nov 2017 | - | | 3.680 | Continuing | Continuing | Continuing |
| Rocket Motor Risk Initiative | WR | NSWC : Indian Head, MD | 0.000 | 0.000 | | 0.100 | Dec 2016 | 0.100 | Dec 2017 | - | | 0.100 | 0.000 | 0.200 | - |
| Front End Design Analysis | SS/CPFF | Orbital ATK : Northridge, CA | 0.000 | 3.234 | Nov 2016 | 7.523 | Feb 2017 | 8.300 | Nov 2017 | - | | 8.300 | Continuing | Continuing | Continuing |
| Missile Section Integration | SS/CPFF | Orbital ATK : Northridge, CA | 0.000 | 0.000 | | 18.600 | Jul 2017 | 29.400 | Nov 2017 | - | | 29.400 | 0.000 | 48.000 | - |
| Engineering & Manufacturing Development | TBD | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 11.020 | Apr 2018 | - | | 11.020 | Continuing | Continuing | Continuing |
| Aircraft Integration | Various | Various : Various | 0.000 | 0.680 | Mar 2016 | 0.204 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | NAWCWD : China Lake, CA | 0.000 | 2.390 | Feb 2016 | 3.923 | Nov 2016 | 5.006 | Nov 2017 | - | | 5.006 | Continuing | Continuing | Continuing |
| Telemetry Section | WR | NAWCWD : China Lake, CA | 0.000 | 0.100 | Feb 2016 | 0.204 | Dec 2016 | 0.204 | Nov 2017 | - | | 0.204 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 6.404 | | 34.162 | | 57.710 | | - | | 57.710 | - | - | - |

**Remarks**

Advanced Anti-Radiation Guided Missile Extended Range was a new start program in FY 2016. FY 2018 activities include completion of the Front End Design Analysis and Missile Section Integration contracts. Completion of the Rocket Motor Risk Initiative. Execution of Milestone B and contract award for the Engineering & Manufacturing Development phase.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Studies & Analysis | Various | Various : Various | 0.000 | 0.870 | Apr 2016 | 3.197 | Apr 2017 | 2.100 | Nov 2017 | - | | 2.100 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.870 | | 3.197 | | 2.100 | | - | | 2.100 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205601N / *Harm Improvement* | Project (Number/Name)<br>2189 / *AARGM ER* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NAWCWD : China Lake, CA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| ER Test Assets | TBD | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Operational and Integrated T&E | WR | Various : Various | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | - | - | - |

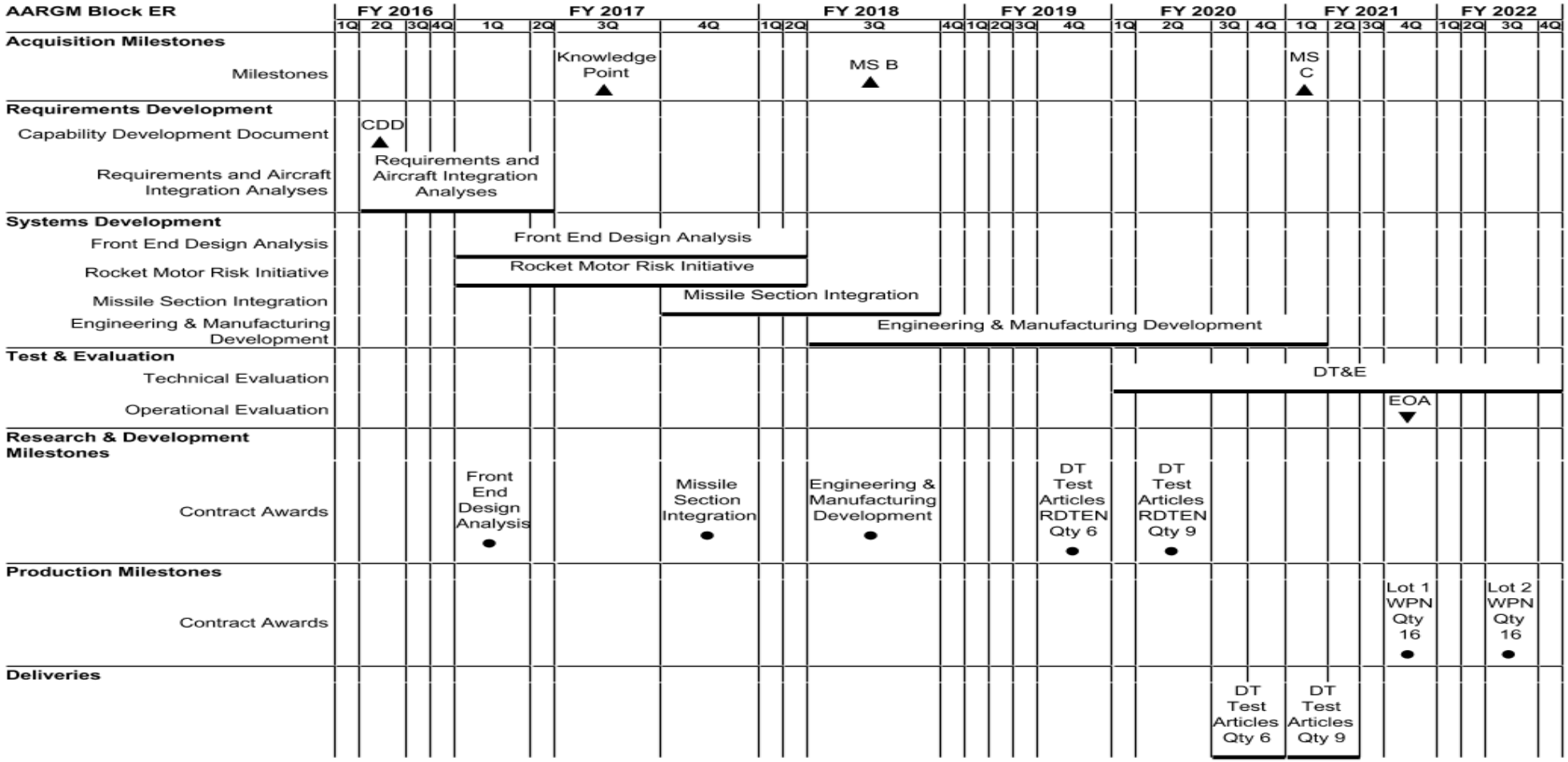
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | Various | Various : Various | 0.000 | 0.638 | Feb 2016 | 2.790 | Nov 2016 | 3.199 | Nov 2017 | - | | 3.199 | Continuing | Continuing | Continuing |
| Government Engineering Support | WR | NAWCAD : Patuxent River, MD | 0.000 | 1.280 | Feb 2016 | 2.804 | Nov 2016 | 3.213 | Nov 2017 | - | | 3.213 | Continuing | Continuing | Continuing |
| Travel | WR | NAVAIR HQ : Patuxent River, MD | 0.000 | 0.020 | Feb 2016 | 0.098 | Nov 2016 | 0.110 | Nov 2017 | - | | 0.110 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 1.938 | | 5.692 | | 6.522 | | - | | 6.522 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 9.212 | | 43.051 | | 66.332 | | - | | 66.332 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2189 / *AARGM ER* |




*2018PB - 0205601N - 2189*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2189 / *AARGM ER* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***AARGM Block ER*** | | | | |
| Acquisition Milestones: Milestones: Knowledge Point | 3 | 2017 | 3 | 2017 |
| Acquisition Milestones: Milestones: MS B | 3 | 2018 | 3 | 2018 |
| Acquisition Milestones: Milestones: MS C | 1 | 2021 | 1 | 2021 |
| Requirements Development: Capability Development Document: Capability Development Document | 2 | 2016 | 2 | 2016 |
| Requirements Development: Requirements and Aircraft Integration Analyses: Requirements and Aircraft Integration Analyses | 2 | 2016 | 2 | 2017 |
| Systems Development: Front End Design Analysis: Front End Design Analysis | 1 | 2017 | 2 | 2018 |
| Systems Development: Rocket Motor Risk Initiative: Rocket Motor Risk Initiative | 1 | 2017 | 2 | 2018 |
| Systems Development: Missile Section Integration: Missile Section Integration | 4 | 2017 | 3 | 2018 |
| Systems Development: Engineering & Manufacturing Development: Engineering & Manufacturing Development | 3 | 2018 | 1 | 2021 |
| Test & Evaluation: Technical Evaluation: Developmental Test & Evaluation | 1 | 2020 | 4 | 2022 |
| Test & Evaluation: Operational Evaluation: Early Operational Assessment | 4 | 2021 | 4 | 2021 |
| Research & Development Milestones: Contract Awards: Front End Design Analysis | 1 | 2017 | 1 | 2017 |
| Research & Development Milestones: Contract Awards: Missile Section Integration | 4 | 2017 | 4 | 2017 |
| Research & Development Milestones: Contract Awards: Engineering & Manufacturing Development | 3 | 2018 | 3 | 2018 |
| Research & Development Milestones: Contract Awards: DT Test Articles RDTEN Qty 6 | 4 | 2019 | 4 | 2019 |
| Research & Development Milestones: Contract Awards: DT Test Articles RDTEN Qty 9 | 2 | 2020 | 2 | 2020 |
| Production Milestones: Contract Awards: Lot 1 WPN Qty 16 | 4 | 2021 | 4 | 2021 |
| Production Milestones: Contract Awards: Lot 2 WPN Qty 16 | 3 | 2022 | 3 | 2022 |
| Deliveries: DT Test Articles Qty 6 | 3 | 2020 | 4 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205601N / *Harm Improvement* | **Project (Number/Name)**<br>2189 / *AARGM ER* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Deliveries: DT Test Articles Qty 9 | 1 | 2021 | 2 | 2021 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 929.114 | 138.549 | 124.785 | 89.852 | - | 89.852 | 111.709 | 114.399 | 87.183 | 57.269 | Continuing | Continuing |
| 2126: *ATDLS Integration* | 714.997 | 44.137 | 37.995 | 23.338 | - | 23.338 | 25.049 | 25.752 | 26.318 | 26.832 | Continuing | Continuing |
| 3020: *MIDS/JTRS* | 182.944 | 68.048 | 57.406 | 50.285 | - | 50.285 | 62.691 | 34.588 | 27.370 | 24.044 | Continuing | Continuing |
| 3341: *Network Tactical Common Data Link* | 31.173 | 26.364 | 29.384 | 16.229 | - | 16.229 | 23.969 | 54.059 | 33.495 | 6.393 | Continuing | Continuing |

**Program MDAP/MAIS Code:**
**Project MDAP/MAIS Code(s):** 554

**A. Mission Description and Budget Item Justification**

Tactical Data Link (TDL) systems includes the Advanced Tactical Data Link Systems (ATDLS) integration programs, specifically Link 16 Network, Command and Control Processor (C2P) and Link Monitoring and Management Tool (LMMT); and Network Tactical Common Data Link (NTCDL) Program which provides the ability to transmit/receive real-time intelligence, surveillance, and reconnaissance (ISR) data simultaneously from multiple sources (surface, air, sub-surface, man-portable), and exchange command and control information (voice, data, imagery, and full motion video (FMV)) across dissimilar joint, service, coalition, and civil networks. The program element also develops and tests tactical data link capability to distribute other data types to new and existing platforms.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under operational systems development because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

Network Tactical Common Data Link (NTCDL) provides the ability to transmit/receive real-time intelligence, surveillance, and reconnaissance (ISR) data simultaneously from multiple sources (air, surface, sub-surface, and man-portable) and exchange command and control information (voice, data, imagery, and full-motion video) across dissimilar joint, service, coalition, and civil networks. NTCDL provides warfighters the capability to support multiple, simultaneous, networked operations with in-service CDL equipped aircraft (e.g., F/A-35, P-3, and MH- 60R) in addition to next-generation manned and unmanned platforms (e.g., P-8 Poseidon, Triton, Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) vehicle, small tactical unmanned aircraft systems (STUAS), and Fire Scout).

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access Area Denial (A2AD). With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M initial capabilities document (ICD) and the JALN-M analysis of alternatives (AoA) final report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the extended data rate (XDR) waveform Navy Multiband Terminal (NMT) for intra-battle group DARE communications, a common data link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced ultra high frequency/high frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, positioning, navigation, and timing (PNT) efforts related to the JALN-M pod will develop a prototype PNT subsystem that will be integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global

Positioning System (GPS) connectivity. The pod is being designed to operate in an A2AD environment, therefore, the pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via Automated Digital Network System (ADNS). ADNS is the method by which Tactical Navy units transfer Internet Protocol (IP) data to Navy and Department of Defense communities on the Global Information Grid (GIG).

Link 16 Network Program provides high power shipboard and shore integrated Link 16 capability through the fielding of Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ships (MOS) and MOS Modernization (MOS Mod) including transmit and receive antennas and High Power Amplifiers (HPA). JTIDS, MOS and MOS Mod utilizes the JTIDS, MIDS Low Volume Terminal (LVT), and MIDS Joint Tactical Radio System (JTRS) terminals respectively, integrates the HPA and interfaces to the shipboard antenna and Command and Control Processor (C2P). MIDS-LVT and MIDS JTRS terminals are developed by the MIDS Program Office. JTIDS terminal is no longer in production, but is undergoing product improvement to maintain interoperability and security with MIDS-LVT and MIDS JTRS. As part of the product improvement all shipboard link 16 terminals are required to have dynamic network management (DNM), crypto modernization (CM) and frequency remapping (FR). MIDS Program Office is developing additional improvements to the MIDS-LVT and MIDS JTRS terminals. The MIDS-LVT will have Link 16 Enhanced Throughput (ET) and the MIDS JTRS will have the added capability of four net concurrent multi-netting (CMN) with current contention receive (CCR) and tactical targeting networking technology (TTNT).

The Multifunctional Information Distribution System (MIDS) program consists of two (2) products, MIDS Low Volume Terminal (LVT) and MIDS Joint Tactical Radio System (JTRS). MIDS-LVT provides Link 16 capability to platforms that were unable to employ Joint Tactical Information Distribution System (JTIDS) due to space and weight constraints. The MIDS-LVT effort is multinational (U.S., France, Germany, Italy, and Spain) with joint service participation (Navy, Army, and Air Force). The Department of Defense (DoD) established the program to design, develop, and deliver low volume, lightweight tactical information system terminals for U.S. and allied fighter aircraft, bombers, helicopters, ships, and ground sites. MIDS-LVT provides interoperability with North Atlantic Treaty Organization (NATO) users, significantly increasing force effectiveness and minimizing hostile actions and friend-on-friend engagements. The terminal design is smaller, lighter, highly reliable, interoperable with JTIDS class 2 terminal, compatible with all the participants' designated platforms, affordable, and re-configurable to individual user needs and budgets.

MIDS JTRS, designed as a pre-planned product improvement (P3I) and executed as an engineering change proposal (ECP) to the production MIDS-LVT configuration, completed qualification in the first quarter of fiscal year 2010. It facilitated the JTRS incremental approach for fielding advanced JTRS transformational networking capability and transformed the MIDS-LVT into a 4-channel, Software Communications Architecture (SCA) compliant, Joint Tactical Radio. A form-fit-function replacement to MIDS-LVT, MIDS JTRS also adds three programmable 2 Megahertz (MHz) to 2 Gigahertz (GHz) channels capable of hosting the JTRS legacy and networking waveforms. In addition to the Link 16, Tactical Air Navigation, and voice functionality found in MIDS-LVT, MIDS JTRS has four channels and adds capabilities such as Link 16 Enhanced Throughput, Link 16 Frequency Re-mapping, software programmability, cryptographic modernization, and Four Net concurrent multi-netting with concurrent contention receive(CMN-4). With CMN-4, MIDS JTRS also utilizes tactical targeting network technology for MIDS JTRS Naval Integrated Fire Control Counter Air and From the Air Advanced Tactical Data Links. These capabilities provide Joint Airborne Network-Tactical Edge functionality to run advanced mission applications in a cross-platform/cross-domain tactical network enterprise and the ability to simultaneously participate in four Link 16 nets.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 142.361 | 124.785 | 60.197 | - | 60.197 |
| Current President's Budget | 138.549 | 124.785 | 89.852 | - | 89.852 |
| Total Adjustments | -3.812 | 0.000 | 29.655 | - | 29.655 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -3.813 | 0.000 | | | |
| • Program Adjustments | 0.001 | 0.000 | 29.000 | - | 29.000 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.655 | - | 0.655 |

**Change Summary Explanation**

ATDLS (2126):
Advanced Tactical Data Link Systems (ATDLS) RDT&E budget requirement decreases from FY 17 to FY 18 as the JTIDS CM/FR, MOS CM/FR and MOS Modernization efforts transition from development to test and as the C2P Technology Refresh effort transitions from development to production. Continued RDT&E budget will be required beyond FY 18 to complete Link 22 development and test, continue LMMT Capability drop 2-4 development and test and to commence C2P Modernization efforts.

Link 16 Network Increment II Cryptographic Modernization (CM)/Frequency Remapping (FR) (2126): MOS TRR added for additional schedule visibility.

Link 16 Network Increment II MOS Modernization (2126): As a result of delays to correct deficiencies found in the government furnished equipment, MOS MOD Test Readiness Review, Production Readiness Review, Developmental Test, Operational Test and Fielding Decision Review has been delayed.

Link 16 Network Increment II AS-4775 Antenna (2126): Deficiencies identified during qualification testing delayed the Fielding Decision Review.

Command and Control Processor (C2P) (2126): On 25 Aug 2015, the Milestone Decision Authority (MDA) issued an Acquisition Decision Memorandum (ADM) that eliminated Command and Control Processor (C2P) Increment 3, and directed execution of C2P Technology Refresh (TR) and Link 22 under the existing Increment 2 Program and the resultant schedule changes to remove Link 22 Milestone C, Link 22 Operational Assessment, Link 22 Full Deployment Decision Review.

Link Monitoring and Management Tool (LMMT) (2126): LMMT CD 3 Design and Development schedule delayed by two years to allow for stability and refinement of Link 22 requirements.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205604N *I Tactical Data Links* |

MIDS (3020):
MIDS RDTE from FY17 to FY18 decreases due to MIDS-LVT Block Upgrade 2 (BU2), MIDS JTRS testing events and the development of MIDS Modernization Increment 1 completing in FY17 and winding down in the beginning of FY18. In FY18, the MIDS Modernization Increment 2 (MMI2) full development begins after the risk reduction work is complete, and the MIDS JTRS CSS upgrade and TTNT development efforts continue into FY18.

MMI2 risk reduction work will complete in 2Q18 with the full development to begin in 3Q18. MMI2 PDR (1Q19), CDR (4Q19), and TRR (4Q19) were added to the schedule. MMI2 DT/Flight Testing (2Q21-1Q22), Verification and Validation (1Q22-3Q22) and the Engineering Release for fixes found in the DT testing (2Q22) were also added to the schedule.

Network Tactical Common Data Link (NTCDL) and High Capacity Backbone (HCB)(3341): FY18 request is for NTCDL product development, to include the development of two (2) the NTCDL Engineering Development Models (EDMs) and associated software. In addition the FY18 request includes airborne terminal research and development of High Capacity Backbone (HCB) and air-to-air relay activities in an Anti- Access/Area Denial (A2/AD) environment.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | Date: May 2017 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | | | | Project (Number/Name)<br>2126 / *ATDLS Integration* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2126: *ATDLS Integration* | 714.997 | 44.137 | 37.995 | 23.338 | - | 23.338 | 25.049 | 25.752 | 26.318 | 26.832 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project develops and improves the Navy's Tactical Data Link (TDL) systems. It includes the Advanced Tactical Data Link Systems (ATDLS) Integration Programs, specifically Link 16 Network, Command and Control Processor (C2P) and Link Monitoring and Management Tool (LMMT).

ATDLS Integration Program develops new and improved capabilities for Navy TDL users. The Navy Link 16 Network Increment II consists of Dynamic Network Management (DNM), Cryptographic Modernization (CM) and Frequency Remapping (FR). C2P Technology Refresh (TR) and C2P Interoperability will modernize legacy C2P processing components to address C2P component obsolescence and fleet interoperability issues. C2P is a critical component in the Aegis Ballistic Missile Defense (BMD) architecture. C2P Modernization is a service life extension program required to sustain C2P support of Naval Integrated Air and Missile Defense (IAMD) and BMD capabilities. Link 22 development and integration into the C2P allows for standard data link communication with Coalition forces. LMMT will upgrade commercial off-the-shelf hardware and modernize software operating systems. LMMT will improve TDL performance monitoring and management in support of the Integrated Air & Missile Defense (IAMD) and Ballistic Missile Defense (BMD) missions.

Link 16 Network Increment II: (1) Develop and implement CM and FR mandates as a product improvement into Link 16 terminals and integration into shore sites, ship (NGC2P, Next Generation Command and Control Processor), and current Navy Joint Tactical Information Distribution System (JTIDS) airborne platforms; (2) Developmental Testing (DT) / Operational Testing (OT) of Navy platform CM/FR modifications; (3) provide product improvement for continued production capability Multifunctional Information Distribution System (MIDS) on Ship (MOS) Modernization (MOS Mod) and extensibility to new Tactical Data Link capabilities of shipboard Link 16 terminals, (4) qualification of replacement shipboard Link 16 antenna to replace end of life existing antenna.

FY 2018 Justification: Conduct government testing of the JTIDS CM/FR Low Rate Initial Production units and deficiency correction. Initiate government developmental and operational testing. Prepare for JTIDS CM/FR fielding decision review. The E-2C Program Office (PMA-231) will complete software modifications to the E-2C host processing required to implement the CM/FR capability. PMA 231 will complete E-2C government testing of JTIDS CM/FR. Funding will also provide for MOS CM/FR to complete integrated testing and deficiency correction of the MOS CM/FR with the High-Power Amplifier (HPA) Switch necessary for integration of the MIDS LVT Block Updated 2 configuration. MOS will initiate developmental testing to support follow on operational testing. To address continued production capability, fielding of CM/FR capability and extensibility to new Tactical Data Link capabilities, funding will provide for deficiency correction of MOS Mod and associated MIDS JTRS terminals, continued contractor integration and certification, and conduct of developmental and operational testing. JTIDS, and MOS CM/FR, and MOS Mod efforts are in support of NSA and Joint Chiefs of Staff mandates for the modernization of the cryptographic algorithm used in Link 16 terminals and the Department of Defense and the Department of Transportation Memorandum of Agreement for the implementation of a capability to remap any 14 of the existing 51 frequencies in order to remain operable within the United States and its possessions. All Link 16 terminals are required to have this capability to support Link 16 Interoperability. Space and Naval Warfare (SPAWAR) Systems Centers will continue government testing and deficiency correction of the new Link 16 antenna, which will replace the obsolete AS-4127A.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

Command and Control Processor (C2P) Technology Refresh (TR) funds a product improvement effort to the legacy C2P hardware components and allows legacy C2P software to execute on modern processors, thereby extending its effective service life. Product improvement efforts will include C2P software development, hardware integration, update of the C2P development environment to promote sustainability and testing to include follow-on test and evaluation (FOT&E) of the C2P TR baseline. Software development contractors will transform C2P legacy software code with modern supportable software code.

C2P, Phase 3, Increment 2 is planned to include Link 22, which is a modernized replacement for Link 11, providing beyond line of sight (BloS) tactical data communication system utilizing fixed frequency or frequency hopping techniques in the high frequency (HF) (3-30 Megahertz (MHz)) and/or the ultra high frequency (UHF) (225-400 MHz) bands.

C2P Modernization funds the transition of the C2P's legacy CMS-2Y software code to a modern software language. Transition to a modern software language is required to sustain the system software and to enable more affordable transition to new hardware processing components as a result of commercial off the shelf processor obsolescence.

FY 2018 Justification: Continue C2P Technology Refresh development and Link 22 software builds. Continue C2P Modernization engineering assessment.

Link Monitoring and Management Tool (LMMT) is a new system delivered on commercial off-the-shelf hardware providing gateway functions for multiple Tactical Data Link (TDL) interface, routing and display of TDL data to include Link 16 and Joint Range Extension (JRE). LMMT is also capable of performing TDL network planning, monitoring, management, data forwarding between the TDLs and providing tactical data to the Global Command and Control System (GCCS) for establishing the common operational picture. LMMT requirements will be incrementally developed and delivered in capability drops via the Joint Capabilities Integration Development System (JCIDS) IT Box approach.

FY 2018 Justification: Conduct CD 2 developmental testing / operational testing (DT/OT) and CD 2 fielding technical review (FTR).

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Link 16 Network Increment II - Dynamic Network Management (DNM) | 0.121 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Corrected JTIDS and MOS DNM test deficiencies. | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>N/A | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Link 16 Network Increment II - Cryptographic Modernization (CM) / Frequency Remapping (FR) | 17.922 | 13.300 | 10.030 | 0.000 | 10.030 |
| ***Articles:*** | 5 | 6 | 11 | - | 11 |

***FY 2016 Accomplishments:***
Completed design and development work for JTIDS Air Integration of CM/FR for E-2C. Continued contractor qualification and certification of JTIDS CM/FR on engineering manufacturing development (EMD) unit. Initiated government testing of JTIDS CM/FR including shipboard integration. Developed HPA switch necessary for integration of MIDS LVT Block Update 2 (BU2) into MOS terminal. Initiated logistics documentation and conducted testing on HPA switch for MOS CM/FR. Initiated government testing on MOS Modernization terminal. Continued vendor development, qualification and certification of MOS Mod EMD units. Continued Link 16 Network integration logistics support.

***FY 2017 Plans:***
Complete contractor qualification and certification of JTIDS CM/FR on engineering manufacturing development (EMD) unit. Continue government testing and correct identified deficiencies in JTIDS CM/FR LRIP units including shipboard integration. Test the integration of JTIDS CM/FR with the E-2C. Develop MOS CM/FR software modifications necessary for shipboard integration in support of MIDS LVT BU2 changes being performed by the MIDS Program Office. Initiate integration and government testing of MOS CM/FR terminal with HPA switch. Continue logistics documentation on HPA switch for MOS CM/FR. Conduct vendor development, qualification and certification of MOS Mod EMD units. Conduct government testing on MOS Modernization terminal. Integrate and test MIDS JTRS common baseline terminal into MOS Modernization terminal. Continue Link 16 Network integration logistics support. Initiate at sea testing for Link 16 antenna. Correct deficiencies identified in MOS Mod and MIDS JTRS terminal.

***FY 2018 Base Plans:***
Continue government testing and correct identified deficiencies in JTIDS CM/FR LRIP units including shipboard integration. Conduct JTIDS CM/FR shipboard developmental testing. Initiate preparations for JTIDS CM/FR Fielding Decision Review (FDR). Continue to test the integration of JTIDS CM/FR with the E-2C. Conduct MOS CM/FR integration testing and deficiency testing of MOS unit using MIDS LVT CM/FR updated terminals and HPA switch. Continue logistics documentation on HPA switch for MOS CM/FR. Correct identified deficiencies in MOS CM/FR and MIDS LVT CM/FR terminal. Initiate MOS CM/FR developmental testing. Continue vendor testing of MOS Mod EMD units. Continue government testing and initiate at sea developmental and operational testing of MOS Mod. Correct identified deficiencies in MOS Mod and MIDS JTRS terminals. Initiate preparations for MOS Mod FDR fielding decision review. Continue to integrate and test MIDS JTRS common baseline

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| terminal into MOS Modernization terminal. Correct MIDS JTRS common baseline terminal deficiencies as identified. Continue Link 16 Network integration logistics support. Continue at sea testing for Link 16 antenna.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Command and Control Processor (C2P)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Continued C2P TR development. Conducted C2P Tech Refresh test readiness review (TRR) event and commenced independent verification and validation (IV&V) testing. Continued Link 22 development and integration and completed Link 22 Software Build 1.<br>***FY 2017 Plans:***<br>Continue C2P TR and Link 22 development. Complete C2P TR independent verification and validation (IV&V) testing. Conduct C2P Link 22 test readiness review (TRR) event and commence Link 22 IV&V testing. Complete Link 22 Software Build 2. Transform C2P legacy software to modern C2P software language for Build 1.<br>***FY 2018 Base Plans:***<br>Continue C2P Link 22 development. Perform C2P Link 22 Baseline TR host integration and at-sea testing with platform combat systems. Initiate and complete Link 22 Software Build 3. Conduct Link 22 IV&V testing. Commence Link 22 baseline integration testing with platform combat systems. Commence C2P Modernization hardware/software engineering.<br>***FY 2018 OCO Plans:***<br>N/A | 19.783<br>- | 19.357<br>- | 11.318<br>- | 0.000<br>- | 11.318<br>- |
| ***Title:*** Link Monitoring and Management Tool (LMMT)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Began limited fielding for non-operational shore sites. Conducted CD 1 joint interoperability certifications. Conducted combined DT/OT for ashore and afloat CD 1. Conducted CD 2 build decision (BD) and commenced CD 2 development and testing efforts.<br>***FY 2017 Plans:*** | 6.311<br>- | 5.338<br>- | 1.990<br>- | 0.000<br>- | 1.990<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Conduct fielding decision review (FDR) / initial operating capability (IOC) for CD 1. Continue CD 2 build and initiate CD 2 DT/OT planning.<br>***FY 2018 Base Plans:***<br>Complete CD 2 DT/OT. Complete CD 2 fielding technical review (FTR).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 44.137 | 37.995 | 23.338 | 0.000 | 23.338 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2614: *Adv Tact Data Link Sys (ATDLS)* | 22.169 | 30.105 | 38.516 | - | 38.516 | 34.696 | 37.983 | 40.912 | 46.829 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The JTIDS Crypto Modernization (CM)/Frequency Remapping (FR) development and low rate initial production (LRIP) contract was awarded to Data Link Solutions (DLS). The associated production contract for JTIDS CM/FR will be competitively awarded to support procurement after decision review. Multifunctional Information Distribution System (MIDS) on Ship (MOS) CM/FR will be accomplished through integration of the MIDS LVT Block Upgrade 2 (BU) into the existing MOS cabinet. MOS CM/FR integration will require development of a High-Power Amplifier (HPA) bypass switch and an update to the MOS Terminal Controller software. HPA bypass switch development is being conducted by SSC Pacific. The MOS Terminal Controller software was contracted in FY16 with DLS. A follow-on MOS production and sustainment contract will be awarded for the production of MOS HPA switches. MOS MOD contract will provide three engineering manufacturing development (EMD) units for developmental and operational testing. The MOS MOD contract will also provide full rate production units.

The C2P Technology Refresh (TR) and Link 22 development contract was awarded to Northrop Grumman. The Data Terminal Set (DTS) contract to support the Link 11/Link 22 functions of the C2P system was awarded in August 2016. An existing IDIQ MAC contract will be used to procure initial TR units with a new C2P production contract planned for future procurements in FY 18 and beyond.

The Link Monitoring and Management Tool (LMMT) capability will replace previously-fielded Air Defense Systems Integrator (ADSI) systems. LMMT will leverage existing government-off-the-shelf (GOTS) software and commercial-off-the-shelf (COTS) hardware. LMMT capabilities are implemented primarily in software and will be developed in capability drops (CDs). Existing GOTS software will be updated to incorporate network performance monitoring and management capabilities by Space

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

and Naval Warfare (SPAWAR) System Center (SSC). Afloat fielding decision will be accomplished after capability drop (CD) developmental test/operational test (DT/OT).

**E. Performance Metrics**

Link 16 Network Dynamic Network Management (DNM): Successfully achieve initial operational capability. Successfully conduct full deployment decision review. Successfully complete operation test readiness review (OTRR). Successfully complete developmental test / operational test.

Link 16 Network Cryptographic Modernization: Successful implementation of updated cryptographic algorithm as specified by National Security Agency (NSA) certification in Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ship (MOS), and MOS Modernization (MOS Mod) Link 16 terminals.

Link 16 Network Frequency Remapping: Successful implementation of a frequency remapping capability as specified in Department of Defense/Department of Transportation Memorandum of Agreement regarding the 960-1215 MHz frequency band of 31 Dec 02 in Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ship (MOS) and MOS Modernization (MOS Mod) Link 16 Terminals.

Link 16 Antenna: Meet existing antenna performance specifications.

Link 16 Network Production Capability: Production shipboard Link 16 terminals available to meet new construction shipboard requirements.

Command and Control Processor (C2P): Successfully achieve C2P Technology Refresh fielding and thereby maintain operational availability.

Link 22: Successfully achieve Link 22 implementation fielding, meeting operational requirement.

LMMT: Successfully meet operational requirements and achieve fielding decision reviews (FDR) for Capability Drops 1, 2 and 3.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>2126 / *ATDLS Integration* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATDLS Product Development and Integration | Various | Various : Various | 363.158 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 363.158 | 363.158 |
| Link 16 Network Development (JTIDS) | C/CPIF | DLS (BAE/ Rockwell) : Wayne, NJ | 61.010 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Link 16 Network Development (MOS) | C/FFP | DLS (BAE/ Rockwell) : Wayne, NJ | 0.034 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.034 | Continuing |
| Link 16 Network Development (MIDS LVT/ MIDS J) | WR | MIDS IPO : San Diego, CA | 6.614 | 0.300 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.914 | Continuing |
| Link 16 Network E-2C Integration | WR | PMA 231 : Pax River, MD | 5.896 | 2.774 | Jan 2016 | 2.614 | Oct 2016 | 2.464 | Oct 2017 | - | | 2.464 | Continuing | Continuing | Continuing |
| Link 16 Network Development (MOS MOD) | C/FPIF | DLS (BAE/ Rockwell) : Wayne, NJ | 14.287 | 2.194 | Feb 2016 | 0.448 | Oct 2016 | 1.183 | Oct 2017 | - | | 1.183 | Continuing | Continuing | Continuing |
| Link 16 Network Software | WR | SPAWARSYSCEN PAC : San Diego, CA | 3.375 | 0.408 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Link 16 Network Integrated Logistics Support | C/CPFF | SeaPort-E : San Diego, CA | 2.552 | 0.220 | Oct 2015 | 0.103 | Nov 2016 | 0.102 | Oct 2017 | - | | 0.102 | Continuing | Continuing | Continuing |
| Link 16 Network JTIDS Depot Repair Bench Update | WR | Warner Robins Air Logistics Center : Warner Robins, GA | 0.000 | 4.596 | Oct 2015 | 4.849 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 9.445 | - |
| Link 16 Network Technical Design Agents | C/CPFF | SeaPort-E : San Diego, CA | 2.643 | 2.195 | Oct 2015 | 1.456 | Nov 2016 | 0.948 | Oct 2017 | - | | 0.948 | 0.000 | 7.242 | - |
| Link 16 Network Systems Engineering | WR | SPAWARSYSCEN PAC : San Diego, CA | 51.014 | 2.322 | Oct 2015 | 1.530 | Oct 2016 | 1.487 | Oct 2017 | - | | 1.487 | Continuing | Continuing | Continuing |
| Link 16 Network IV&V | WR | SPAWARSYSCEN PAC : San Diego, CA | 3.071 | 1.196 | Oct 2015 | 0.380 | Oct 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| C2P Development (Tech Refresh) | C/IDIQ | Northrop Grumman : San Diego, CA | 19.944 | 1.500 | Jun 2016 | 0.872 | May 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| C2P Development (Link 22) | C/IDIQ | Northrop Grumman : San Diego, CA | 2.736 | 1.500 | Jul 2016 | 0.872 | May 2017 | 2.224 | Nov 2017 | - | | 2.224 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>2126 / *ATDLS Integration* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C2P Development Data Terminal Set | C/IDIQ | TBD : TBD | 1.227 | 4.390 | Jan 2016 | 1.647 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 7.264 | - |
| C2P Development (Interoperability) | WR | SPAWARSYSCEN PAC : San Diego, CA | 6.599 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.599 | Continuing |
| C2P Systems Engineering | WR | SPAWARSYSCEN PAC : San Diego, CA | 18.074 | 0.690 | Oct 2015 | 4.037 | Oct 2016 | 1.029 | Oct 2017 | - | | 1.029 | Continuing | Continuing | Continuing |
| C2P IV&V | WR | SPAWARSYSCEN PAC : San Diego, CA | 5.186 | 3.691 | Oct 2015 | 3.842 | Oct 2016 | 3.424 | Oct 2017 | - | | 3.424 | Continuing | Continuing | Continuing |
| C2P Development & Integration | WR | SPAWARSYSCEN PAC : San Diego, CA | 4.043 | 6.151 | Oct 2015 | 5.706 | Oct 2016 | 1.211 | Oct 2017 | - | | 1.211 | 0.000 | 17.111 | - |
| C2P Integrated Logistics Support | C/CPFF | SeaPort-E : San Diego, CA | 4.259 | 0.250 | Oct 2015 | 0.254 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| LMMT Integrated Logistics Support | C/CPFF | SeaPort-E : San Diego, CA | 0.683 | 0.350 | Oct 2015 | 0.350 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| LMMT Development | WR | SPAWARSYSCEN PAC : San Diego, CA | 4.598 | 2.670 | Oct 2015 | 1.938 | Oct 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| LMMT Systems Engineering | WR | SPAWARSYSCEN PAC : San Diego, CA | 2.797 | 1.000 | Oct 2015 | 1.000 | Oct 2016 | 0.650 | Oct 2017 | - | | 0.650 | Continuing | Continuing | Continuing |
| LMMT IV&V | WR | SPAWARSYSCEN PAC : San Diego, CA | 0.312 | 0.667 | Oct 2015 | 0.800 | Oct 2016 | 0.310 | Oct 2017 | - | | 0.310 | Continuing | Continuing | Continuing |
| JALN Development | WR | AFRL : W. Patterson AFB, OH | 6.600 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 590.712 | 39.064 | | 32.698 | | 15.032 | | - | | 15.032 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATDLS Test and Evaluation | Various | Various : Various | 65.171 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 65.171 | 65.171 |
| Link 16 Network T&E | WR | SPAWARSYSCEN PAC : San Diego, CA | 9.589 | 1.264 | Oct 2015 | 1.586 | Oct 2016 | 3.684 | Mar 2018 | - | | 3.684 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>2126 / *ATDLS Integration* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C2P T&E | WR | SPAWARSYSCEN PAC : San Diego, CA | 1.951 | 0.150 | Jan 2016 | 0.150 | Oct 2016 | 1.994 | Nov 2017 | - | | 1.994 | 0.000 | 4.245 | Continuing |
| LMMT T&E | WR | SPAWARSYSCEN PAC : San Diego, CA | 1.150 | 1.250 | Oct 2015 | 0.800 | Oct 2016 | 0.515 | Oct 2017 | - | | 0.515 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 77.861 | 2.664 | | 2.536 | | 6.193 | | - | | 6.193 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATDLS System Engineering Support | Various | Various : Various | 20.177 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 20.177 | 20.177 |
| Link 16 Network Contractor Engineering Support | C/CPFF | SeaPort-E : San Diego, CA | 9.533 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.533 | Continuing |
| Link 16 Network Government Engineering Support | WR | SPAWARSYSCEN PAC : San Diego, CA | 6.278 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.278 | Continuing |
| Link 16 Network Program Management Support | C/CPFF | SeaPort-E : San Diego, CA | 4.529 | 0.573 | Oct 2015 | 0.335 | Nov 2016 | 0.161 | Oct 2017 | - | | 0.161 | Continuing | Continuing | Continuing |
| C2P Program Management Support | C/CPFF | SeaPort-E : San Diego, CA | 5.211 | 1.461 | Oct 2015 | 0.800 | Nov 2016 | 0.716 | Nov 2017 | - | | 0.716 | Continuing | Continuing | Continuing |
| C2P Systems Engineering Support | C/CPFF | SeaPort-E : San Diego, CA | 0.000 | 0.000 | | 1.176 | Nov 2016 | 0.720 | Nov 2017 | - | | 0.720 | 0.000 | 1.896 | - |
| LMMT Program Management Support | C/CPFF | SeaPort-E : San Diego, CA | 0.696 | 0.375 | Oct 2015 | 0.450 | Nov 2016 | 0.516 | Oct 2017 | - | | 0.516 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 46.424 | 2.409 | | 2.761 | | 2.113 | | - | | 2.113 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 714.997 | 44.137 | | 37.995 | | 23.338 | | - | | 23.338 | - | - | - |

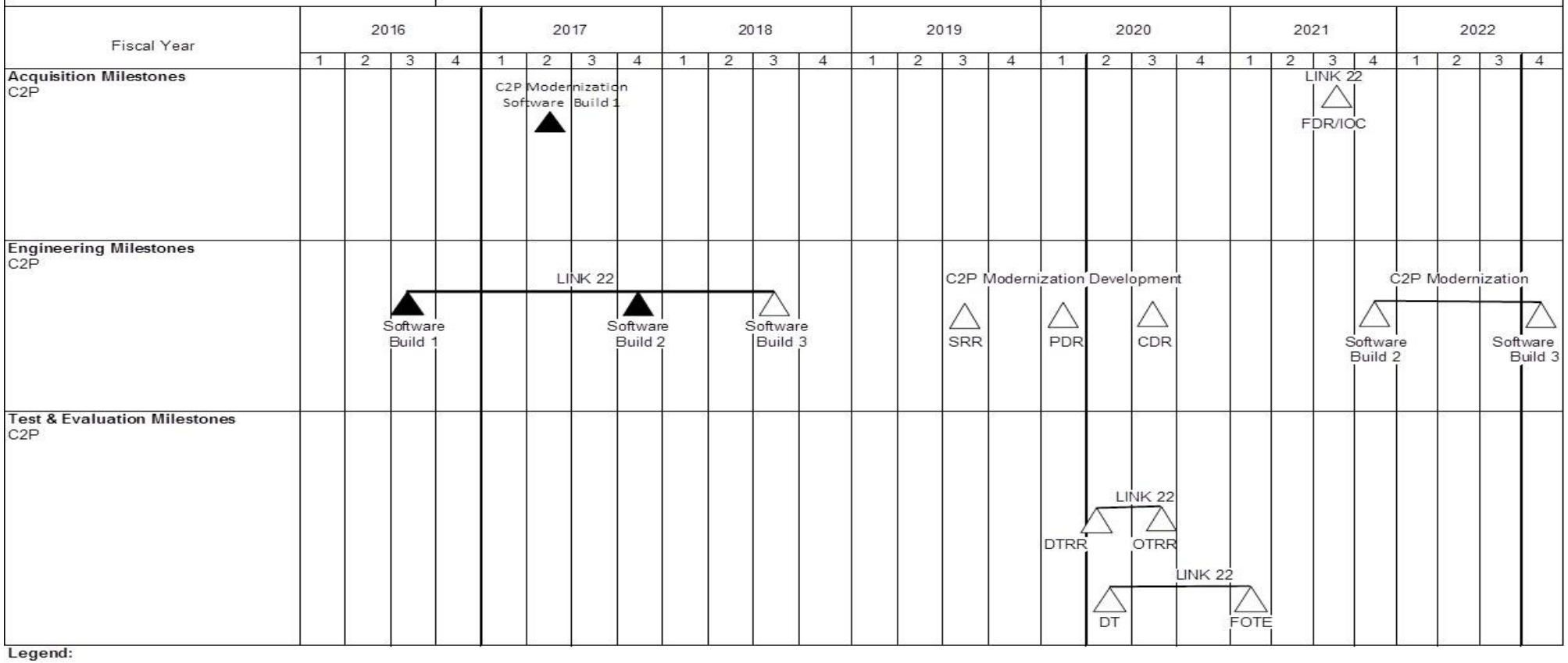
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

**EXHIBIT R-4, RDT&E Schedule Profile: President's Budget 2018 Navy**

| APPROPRIATION/BUDGET ACTIVITY | R-1 ITEM NOMENCLATURE | PROJECT |
|---|---|---|
| 1319 / 07 | PE 0205604N: *Tactical Data Links* | 2126: ATDLS Integration |

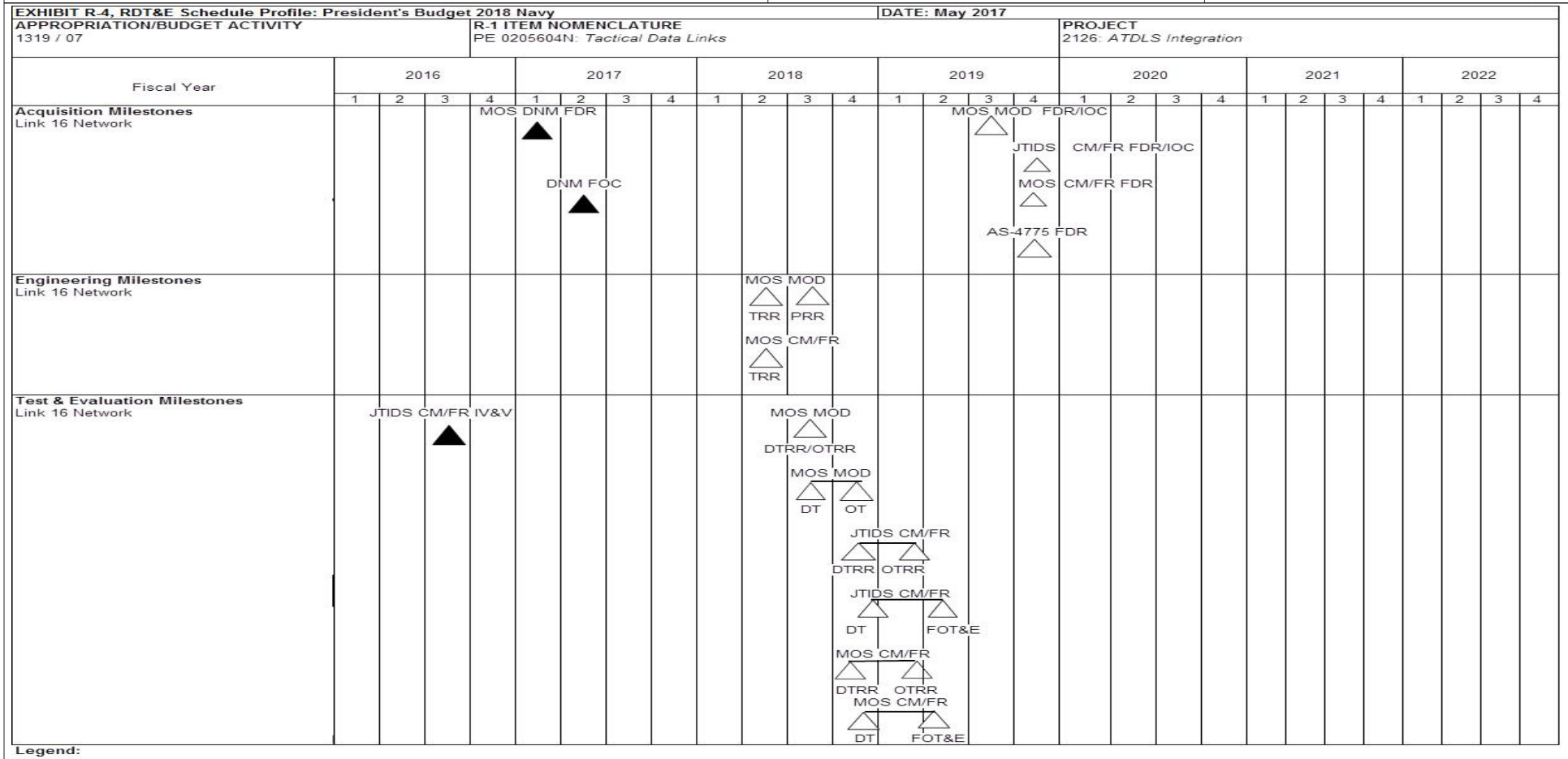
DATE: May 2017




**Legend:**

C2P - Command and Control Processor
CDR - Critical Design Review
DT - Developmental Test
FDR - Fielding Decision Review
FOTE - Follow on Test and Evaluation
IOC - Initial Operating Capability
OTRR - Operational Test Readiness Review
PDR - Preliminary Design Review
SRR - System Requirement Review

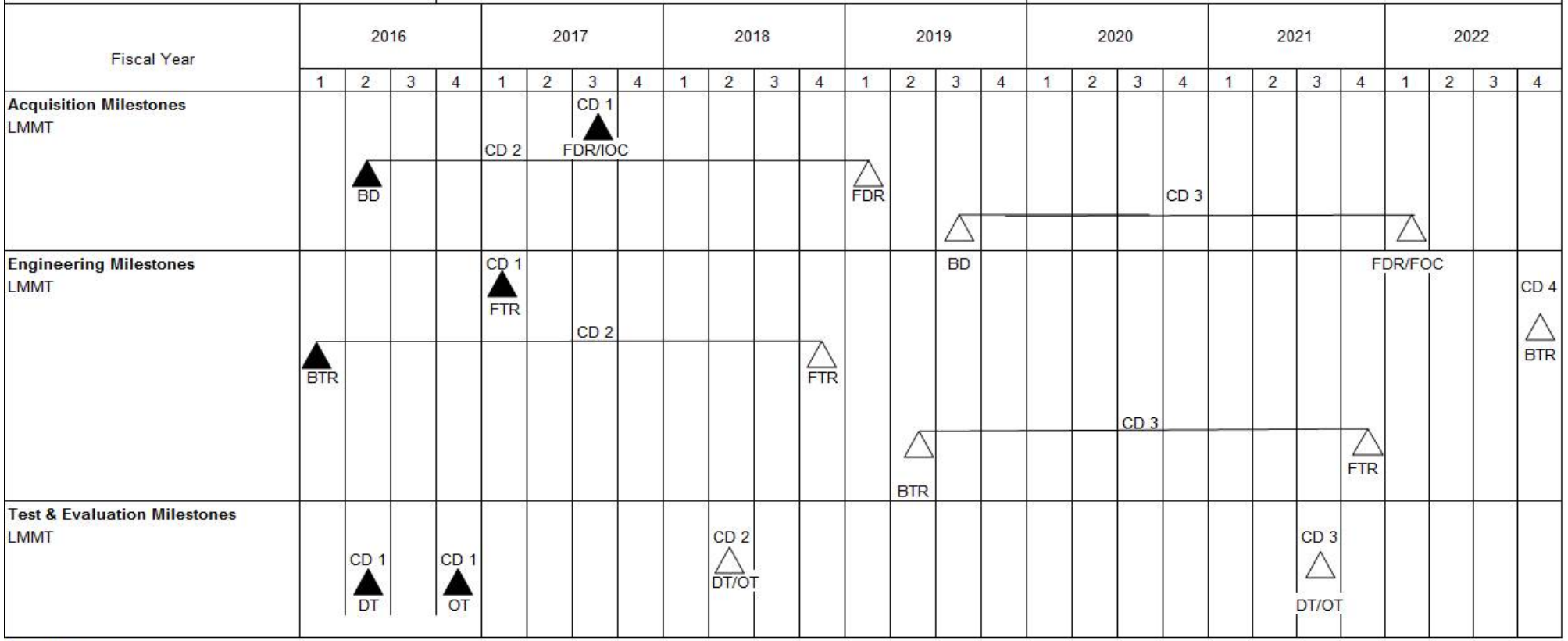
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

**EXHIBIT R-4, RDT&E Schedule Profile: President's Budget 2018 Navy** | **DATE: May 2017**

**APPROPRIATION/BUDGET ACTIVITY**: 1319 / 07 | **R-1 ITEM NOMENCLATURE**: PE 0205604N: Tactical Data Links | PROJECT: 2126: ATDLS Integration




**Legend:**

BD - Build Decision | CD - Capability Drop | FDR - Fielding Decision Review | FTR - Fielding Technical Review | OT - Operational Test

BTR - Build Technical Review | DT - Developmental Test | FOC - Full Operational Capability | IOC - Initial Operating Capability

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2126*** | | | | |
| LMMT CD 2 Build Technical Review | 1 | 2016 | 1 | 2016 |
| LMMT CD 2 Build Decision | 2 | 2016 | 2 | 2016 |
| LMMT CD 1 Developmental Test | 2 | 2016 | 2 | 2016 |
| C2P Link 22 Software Build 1 | 3 | 2016 | 3 | 2016 |
| Link 16 Network JTIDS CM/FR IV&V | 3 | 2016 | 3 | 2016 |
| LMMT CD 1 Operational Test | 4 | 2016 | 4 | 2016 |
| Link 16 Network MOS Modernization Test Readiness Review | 2 | 2018 | 2 | 2018 |
| Link 16 Network MOS Modernization Production Readiness Review | 3 | 2018 | 3 | 2018 |
| LMMT CD 1 Fielding Technical Review | 1 | 2017 | 1 | 2017 |
| Link 16 Network MOS DNM Fielding Decision Review | 1 | 2017 | 1 | 2017 |
| C2P Modernization Software Build 1 | 2 | 2017 | 2 | 2017 |
| Link 16 Network DNM Full Operating Capability | 2 | 2017 | 2 | 2017 |
| Link 16 Network MOS MOD Developmental Test Readiness Review | 2 | 2018 | 2 | 2018 |
| LMMT CD 1 Fielding Decision Review/Initial Operating Capability | 3 | 2017 | 3 | 2017 |
| Link 16 Network MOS MOD Developmental Test | 3 | 2018 | 3 | 2018 |
| LMMT CD 3 Build Technical Review | 2 | 2019 | 2 | 2019 |
| Link 16 Network MOS MOD Operational Test Readiness Review | 3 | 2018 | 3 | 2018 |
| Link 16 Network MOS MOD Operational Test | 4 | 2018 | 4 | 2018 |
| LMMT CD 3 Build Decision | 3 | 2019 | 3 | 2019 |
| C2P Link 22 Software Build 2 | 4 | 2017 | 4 | 2017 |
| LMMT CD 2 Developmental/Operational Test | 2 | 2018 | 2 | 2018 |
| Link 16 Network MOS MOD Fielding Decision Review/Initial Operating Capability | 3 | 2019 | 3 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Link 16 Network AS-4775 Fielding Decision Review | 4 | 2019 | 4 | 2019 |
| C2P Link 22 Software Build 3 | 3 | 2018 | 3 | 2018 |
| Link 16 Network JTIDS CM/FR (Ship/Air) Developmental Test Readiness Review | 4 | 2018 | 4 | 2018 |
| Link 16 Network JTIDS CM/FR (Ship/Air) Developmental Test | 4 | 2018 | 4 | 2018 |
| LMMT CD 2 Fielding Technical Review | 4 | 2018 | 4 | 2018 |
| Link 16 Network MOS CM/FR Developmental Test Readiness Review | 4 | 2018 | 4 | 2018 |
| Link 16 Network MOS CM/FR Developmental Test | 4 | 2018 | 4 | 2018 |
| LMMT CD 2 Fielding Decision Review | 1 | 2019 | 1 | 2019 |
| Link 16 Network JTIDS CM/FR Operational Test Readiness Review | 1 | 2019 | 1 | 2019 |
| Link 16 Network MOS CM/FR Operational Test Readiness Review | 1 | 2019 | 1 | 2019 |
| C2P Link 22 Developmental Test Readiness Review | 2 | 2020 | 2 | 2020 |
| LMMT CD 4 Build Technical Review | 4 | 2022 | 4 | 2022 |
| Link 16 Network JTIDS CM/FR Follow-On Operational Test & Evaluation | 2 | 2019 | 2 | 2019 |
| Link 16 Network MOS CM/FR Follow-On Operational Test and Evaluation | 2 | 2019 | 2 | 2019 |
| LMMT CD 4 Build Decision | 4 | 2019 | 4 | 2019 |
| C2P Modernization Development System Requirement Review | 3 | 2019 | 3 | 2019 |
| LMMT CD 3 Developmental/Operational Test | 3 | 2021 | 3 | 2021 |
| C2P Link 22 Developmental Test | 2 | 2020 | 2 | 2020 |
| Link 16 Network JTIDS CM/FR Fielding Decision Review/Initial Operating Capability | 4 | 2019 | 4 | 2019 |
| Link 16 Network MOS CM/FR Fielding Decision Review | 4 | 2019 | 4 | 2019 |
| C2P Modernization Development Preliminary Design Review | 1 | 2020 | 1 | 2020 |
| C2P Link 22 Operational Test Readiness Review | 2 | 2020 | 2 | 2020 |
| LMMT CD 3 Fielding Technical Review | 4 | 2021 | 4 | 2021 |
| LMMT CD 3 Fielding Decision Review | 1 | 2022 | 1 | 2022 |
| C2P Link 22 Follow on Test and Evaluation | 1 | 2021 | 1 | 2021 |
| C2P Modernization Development Critical Design Review | 3 | 2020 | 3 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>2126 / *ATDLS Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| C2P Link 22 Fielding Decision Review/Initial Operating Capability | 3 | 2021 | 3 | 2021 |
| LMMT CD 3 Full Operational Capability | 1 | 2022 | 1 | 2022 |
| C2P Modernization Software Build 2 | 4 | 2021 | 4 | 2021 |
| C2P Modernization Software Build 3 | 4 | 2022 | 4 | 2022 |
| Link 16 Network MOS CM/FR Test Readiness Review | 2 | 2018 | 2 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3020 / *MIDS/JTRS* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3020: *MIDS/JTRS* | 182.944 | 68.048 | 57.406 | 50.285 | - | 50.285 | 62.691 | 34.588 | 27.370 | 24.044 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 554

**Note**

In accordance with the Acquisition Decision Memorandum dated 11 July 2012, the Joint Tactical Radio Systems Programs of Record (JTRS PORs) transitioned to a Military Department-managed program. MIDS transitioned to the Navy under PE 0205604N but was formerly in PE 0604280N.

**A. Mission Description and Budget Item Justification**

The Multifunctional Information Distribution System (MIDS) program consists of two (2) products, MIDS Low Volume Terminal (LVT) and MIDS Joint Tactical Radio System (JTRS). MIDS-LVT provides Link 16 capability to platforms that were unable to employ Joint Tactical Information Distribution System due to space and weight constraints. The MIDS-LVT effort is multinational (U.S., France, Germany, Italy, and Spain) with joint Service participation (Navy, Army, and Air Force). The Department of Defense (DoD) established the program to design, develop, and deliver low volume, lightweight tactical information system terminals for U.S. and Allied fighter aircraft, bombers, helicopters, ships, and ground sites. MIDS-LVT provides interoperability with North Atlantic Treaty Organization (NATO) users, significantly increasing force effectiveness and minimizing hostile actions and friend-on-friend engagements. The terminal design is smaller, lighter, highly reliable, interoperable with Joint Tactical Information Distribution System (JTIDS) Class 2 terminal, compatible with all the participants' designated platforms, affordable, and re-configurable to individual user needs and budgets.

MIDS JTRS, designed as a Pre-Planned Product Improvement (P3I) and executed as an Engineering Change Proposal (ECP) to the production MIDS-LVT configuration, completed qualification in the first quarter of fiscal year 2010. It facilitated the JTRS incremental approach for fielding advanced JTRS transformational networking capability and transformed the MIDS-LVT into a 4-channel, Software Communications Architecture (SCA) compliant, Joint Tactical Radio. A form-fit-function replacement to MIDS-LVT, MIDS JTRS also adds three programmable 2 Megahertz (MHz) to 2 Gigahertz (GHz) channels capable of hosting the JTRS legacy and networking waveforms. In addition to the Link 16, Tactical Air Navigation, and voice functionality found in MIDS-LVT, MIDS JTRS has four channels and adds capabilities such as Link 16 Enhanced Throughput, Link 16 Frequency Re-mapping, software programmability, Cryptographic Modernization, and Four Net Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4). With CMN-4, MIDS JTRS also utilizes Tactical Targeting Network Technology for MIDS JTRS Naval Integrated Fire Control Counter Air and From the Air Advanced Tactical Data Links. These capabilities provide Joint Airborne Network-Tactical Edge functionality to run advanced mission applications in a cross-platform/cross-domain tactical network enterprise and the ability to simultaneously participate in four Link 16 Nets.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** MIDS | 68.048 | 57.406 | 50.285 | 0.000 | 50.285 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Commenced Full Operational Test and Evaluation. Completed BC2 (MIDS on Ship Modernization). Awarded Lot 5 for Multifunctional Information Distribution System Joint Tactical Radio System (MIDS JTRS) Production. Merged the Block Cycle 2 (BC2) baseline with Four Net Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4) baseline (Block Cycle 3) and began the upgrade of the Crypto Sub System (CSS) for incorporation into MIDS JTRS and Tactical Targeting Network Technology (TTNT) terminals.<br><br>Continued full development effort of TTNT for MIDS JTRS Naval Integrated Fire Control Counter Air and From the Air Advanced Tactical Data Links (NIFC-CA FTA ATDL) for the L band. Began S band technology development (contract) to incorporate the existing TTNT L band terminal development into the TTNT S band frequency (no SRF funding will be used on the L band requirement, but there are L band requirements in the S band contract-cost sharing). The L band requirements (Navy RDTE) are delineated tasks and tracked separately from the S band requirements (SRF funded). Conducted Delta Preliminary Design Review for the TTNT L band and S band terminals. Awarded full development contract for TTNT S band terminal to include test and integration of the L Band terminal.<br><br>Continued the qualification and certification efforts and first article qualification testing for MIDS-LVT BU2. Continued the software bind to incorporate Block Cycle 9 as the baseline for BU2 terminals.<br><br>Continued MIDS Modernization Increment 1 efforts to include specification development to define the Functional and Allocated baseline requirements.<br><br>Continued to incorporate new waveforms such as Multi-Function Advanced Data Link (MADL), Common Data Link (CDL), and others into the MIDS JTRS terminal. Continued MIDS systems engineering, communication security, Information Assurance (IA) and program management support.<br><br>Began work on MIDS Modernization Increment 2 for Air Dominance Assured Communications to include the design. Begin Link 16 waveform development fixes/updates for incorporation into the new MIDS JTRS hardware (CMN-4 and TTNT) terminals. | | | | | |
| ***FY 2017 Plans:***<br>Complete Full Operational Test and Evaluation and collecting Operational Assessment data of Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4) for MIDS JTRS. Receive Operational Testing Report and achieve Initial Operational Capability for MIDS JTRS CMN-4. Continue the CSS upgrade for incorporation into MIDS JTRS and Tactical Targeting Network Technology (TTNT) terminals. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete the efforts of Tactical Targeting Network Technology (TTNT), for MIDS JTRS Naval Integrated Fire Control Counter Air and From the Air Advanced Tactical Data Links (NIFC-CA FTA ATDL), L band with the Engineering Design Model delivery. Continue TTNT development to migrate from the L band to the S band. This includes detailed design through Delta Critical Design Review (CDR) and Build Pass 1 for the Transceivers, TTNT External Power Amplifiers (TEPA) and High Powered Amplifiers (HPA). Conduct Delta CDR between TTNT L and S band terminals' designs. Award the Production Representative Terminal (PRT) contract for TTNT.<br><br>Commence and complete Block Upgrade (BU) 2 qualification and certification efforts and First Article Qualification Test (FAQT). Begin the developmental and service platform/operational delta testing required for the BU2 upgrades to the MIDS-LVT terminals. Begin Platform test and integration of BU2. Award BU2 retrofit contracts.<br><br>Continue to incorporate new waveforms such as Multi-Function Advanced Data Link (MADL), Common Data Link (CDL), and others into the MIDS JTRS terminal. Continue MIDS systems engineering, communication security, IA and program management support.<br><br>Complete MIDS Modernization Increment 1 effort. Continue the Link 16 Waveform Development to incorporate into CMN-4 and TTNT Terminals. Continue the development MIDS Modernization Increment 2 risk reduction effort (for Air Dominance Assured Communications) for the Link 16 waveform.<br><br>***FY 2018 Base Plans:***<br>Complete the MIDS Joint Tactical Radio System (JTRS) Crypto Sub System (CSS) upgrade to be integrated into both MIDS JTRS and TTNT terminals. Begin Engineering Releases 3A and 3B (Block Cycle 3+) to be incorporated into Block Cycle 3 baseline software merge. This enables the wide body aircraft software build and MIDS on Ship software build to be in alignment with the main platform software build. Award the MIDS JTRS CMN-4 Retrofit Delivery Order.<br><br>Continue development of TTNT including Build Pass 2 for the Transceivers, TEPAs and HPAs (SRF funding will not be used on the L band requirements; L band delineated tasks will be tracked separately). Continue to update the operating environment for TTNT. Begin TTNT PRTs delivery. Commence Technology Readiness Review. Begin Contractor and Government First Article Qualification Testing. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete the Multifunctional Information Distribution System Low Volume Terminal (MIDS-LVT) Block Upgrade 2 (BU2) test and integration. Continue the retrofit of BU2 MIDS-LVT Terminals.<br><br>Continue to incorporate new waveforms such as MADL, CDL, and others into the MIDS JTRS terminal. Continue MIDS systems engineering, communication security, IA and program management support.<br><br>Continue the Link 16 Waveform Development and begin the TTNT Waveform development fixes and updates.<br><br>Complete the design and development MIDS Modernization Increment 2 (MMI2) risk reduction effort (for Air Dominance Assured Communications) for the Link 16 waveform. Begin the full development for MMI2 based on the design efforts from the risk reduction work to include the hardware and software development. Begin risk reduction work for MIDS Modernization Increments 3 and 4.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 68.048 | 57.406 | 50.285 | 0.000 | 50.285 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Multifunctional Information Distribution System Joint Tactical System (MIDS JTRS) development was initiated as a major modification to the MIDS-LVT using an Engineering Change Proposal to the existing production contracts. Development efforts included the Phase 2B Core terminal. The U.S. prime contractors from the MIDS-LVT program, Data Link Solutions (DLS) and ViaSat Inc., cooperatively designed and developed the Core terminal. Each prime contractor built and qualified Production Verification Terminals. The U.S. implemented a continuous competition strategy between DLS and ViaSat that will be maintained throughout the MIDS JTRS production phase. This strategy was successfully used on MIDS-LVT production. The FY18 budget supports the continuation of the Tactical Targeting Networking Technology (TTNT) terminal testing and integration as well as the updates to the TTNT waveform. It supports the Test Readiness Review for TTNT and the commencement of Contractor and Government First Article Qualification Testing. It supports the continuation of the MIDS Modernization Increment 2 efforts and conducting future Link 16 Waveform development.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

**E. Performance Metrics**

The MIDS-LVT and MIDS JTRS programs are employing mature, software-defined radio technologies and developing hundreds of thousands of lines of code. These software metrics are used to quantify the quality and progress of each software product's development over time. MIDS employs earned value metrics to monitor contract performance on its prime development contracts, as required.

MIDS-LVT: The 11 performance measures are: L16 Waveform Compatibility, L16 Message Standards, L16 IER; Interoperability, L16 Coded Error Message Probability, Weight/Volume, L16 JAM Resistance, L16 Voice Channels, L16 Communication Range Data, L16 Communications Range Voice, L16 Relay.
MIDS JTRS: The 15 performance measures are: L16 Waveform Compatibility, L16 Waveform Standards, L16 Coded Error Message Probability, L16 Jamming Resistance, L16 Communication Range-Data, L16 Communications Range-Voice, L16 Relay, Start-up (Terminal Single Channel), Operational Communications - Passive Synchronization, Operational Communications - Automatic Message Acknowledgement, Operational Communications - Multi-Net, Operational Communications, Crypto Control, Navigation.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3020 / *MIDS/JTRS* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development Prior Years | Various | Various : Various | 14.705 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 14.705 | 14.705 |
| MIDS JTRS NIFCA TTNT Full Development | C/CPFF | DLS : Cedar Rapids, IA | 48.210 | 10.658 | Mar 2016 | 7.885 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 66.753 | - |
| MIDS JTRS NIFCA TTNT Full Development | C/CPFF | ViaSat : San Diego, CA | 22.609 | 11.689 | Nov 2015 | 0.872 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 35.170 | - |
| MIDS JTRS NIFCA TTNT Waveform Development | C/CPFF | Rockwell Collins : Wayne, NJ | 7.713 | 0.014 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.727 | 7.727 |
| MIDS-LVT BU2 Full Development | C/CPIF | DLS : Cedar Rapids, IA | 18.859 | 9.994 | Oct 2015 | 3.554 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 32.407 | 29.874 |
| MIDS-LVT BU2 Full Development | C/CPIF | ViaSat : San Diego, CA | 23.335 | 10.401 | Nov 2015 | 3.821 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 37.557 | 33.715 |
| MIDS-LVT BU2 Software Full Development | C/CPIF | BAE : Wayne, NJ | 19.450 | 4.276 | Dec 2015 | 0.245 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 23.971 | 24.946 |
| BU2 Interation | TBD | Lockheed Martin : Bethesda, MD | 0.000 | 0.000 | | 0.500 | Aug 2017 | 1.500 | Dec 2017 | - | | 1.500 | 0.000 | 2.000 | - |
| MIDS-LVT LCM | C/FFP | ViaSat : San Diego, CA | 2.189 | 0.014 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.203 | 2.204 |
| MIDS JTRS CMN-4 Production Representative Terminals (PRT) | C/FFP | DLS : Cedar Rapids, IA | 2.010 | 0.335 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.345 | 2.345 |
| MIDS JTRS CMN-4 Production Representative Terminals (PRT) | C/FFP | ViaSat : San Diego, CA | 2.020 | 0.281 | Apr 2016 | 0.483 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 2.784 | 2.301 |
| TTNT Development Contract (L Band) | C/CPFF | DLS : Cedar Rapids, IA | 0.064 | 0.000 | | 13.226 | Mar 2017 | 6.387 | Mar 2018 | - | | 6.387 | Continuing | Continuing | Continuing |
| TTNT Development Contract (L Band) | C/CPFF | ViaSat : San Diego, Ca | 0.020 | 0.000 | | 8.722 | Mar 2017 | 3.348 | Mar 2018 | - | | 3.348 | Continuing | Continuing | Continuing |
| MIDS JTRS Software Merge BC3 | C/CPIF | ViaSat : San Diego, CA | 0.000 | 4.112 | Mar 2016 | 1.288 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 5.400 | 5.112 |
| MIDS Modernization | C/CPFF | DLS : Cedar Rapids, IA | 2.624 | 1.257 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.881 | 3.880 |
| MIDS Modernization | C/CPFF | ViaSat : San Diego, CA | 1.843 | 0.523 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.366 | 2.859 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3020 / *MIDS/JTRS* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Link 16 Waveform Development | WR | SSC PAC : San Diego, CA | 0.000 | 1.876 | Jun 2016 | 1.217 | Dec 2016 | 1.700 | Nov 2017 | - | | 1.700 | Continuing | Continuing | Continuing |
| Air Dominance Assured Communications L16 WF (MIDS Mod Incr 2) | C/BA | NAVAIR : China Lake, CA | 0.000 | 1.112 | Jan 2016 | 0.020 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.132 | 1.112 |
| MIDS Mod Inc 2 Risk Reduction | C/CPFF | DLS : Cedar Rapids, IA | 0.000 | 0.360 | Mar 2016 | 2.813 | Jan 2017 | 4.510 | Dec 2017 | - | | 4.510 | Continuing | Continuing | Continuing |
| MIDS Mod Inc 2 Risk Reduction | C/CPFF | ViaSat : San Diego, CA | 0.000 | 0.300 | Mar 2016 | 2.960 | Jan 2017 | 1.390 | Dec 2017 | - | | 1.390 | Continuing | Continuing | Continuing |
| MIDS JTRS CSS/PCP Respin | C/CPFF | DLS : Cedar Rapids, IA | 0.000 | 1.247 | Aug 2016 | 2.014 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 3.261 | 3.052 |
| MIDS JTRS CSS/PCP Respin | C/CPFF | ViaSat : San Diego, CA | 0.000 | 0.639 | Aug 2016 | 1.552 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 2.191 | - |
| ER3A&3B (MIDS JTRS BC3+) | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 3.000 | Dec 2017 | - | | 3.000 | 0.000 | 3.000 | - |
| MIDS Mod Inc 2 Full Development | C/CPFF | DLS : Cedar Rapids, IA | 0.000 | 0.000 | | 0.000 | | 15.060 | Apr 2018 | - | | 15.060 | Continuing | Continuing | Continuing |
| MIDS Mod Inc 2 Full Development | C/CPFF | ViaSat : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 10.040 | Apr 2018 | - | | 10.040 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 165.651 | 59.088 | | 51.172 | | 46.935 | | - | | 46.935 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Eval Prior Years | Various | Various : Various | 3.529 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.529 | 3.529 |
| Modeling and Simulation | WR | NAVAIR : China Lake, CA | 2.440 | 0.670 | Nov 2015 | 0.464 | Feb 2017 | 0.395 | Jan 2018 | - | | 0.395 | 0.000 | 3.969 | 5.210 |
| MIDS JTRS CMN-4/MIDS Mod GFAQT and LAB | WR | SSC : San Diego, CA | 0.984 | 0.120 | Mar 2016 | 0.132 | Dec 2016 | 0.205 | Dec 2017 | - | | 0.205 | 0.000 | 1.441 | 1.267 |
| TTNT Link 16 Mod/ Simulation | MIPR | Lincoln Labs : Hanscom AFB, MA | 0.700 | 0.276 | Nov 2015 | 0.113 | Dec 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3020 / *MIDS/JTRS* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT/OT CMN-4/MIDS Mod | WR | NAVAIR : China Lake, CA | 0.000 | 0.000 | Apr 2016 | 0.994 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.994 | 2.992 |
| Vlidation/Verificatoin and DT/OT | WR | NAVAIR : China Lake, CA | 0.000 | 2.240 | Feb 2016 | 0.000 | Jan 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MIDS Mod Inc 2 Ref Test Environment | WR | SSC : San Diego, CA | 0.000 | 0.611 | Apr 2016 | 0.000 | Jan 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| JTEL Testing Support | C/CPFF | G-2 : San Diego, CA | 0.000 | 0.000 | | 0.095 | Mar 2017 | 0.095 | Mar 2018 | - | | 0.095 | 0.000 | 0.190 | - |
| MIDS Mod OT Support | C/CPFF | Engility : Chantilly, VA | 0.000 | 0.000 | | 0.042 | Apr 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.042 | - |
| MIDS Mod OT Flight Test | MIPR | Department of Interior : Lakewood, CO | 0.000 | 0.000 | | 0.467 | Apr 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.467 | - |
| | | **Subtotal** | 7.653 | 3.917 | | 2.307 | | 0.695 | | - | | 0.695 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Services Prior Years | Various | Various : Various | 1.201 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.201 | 1.201 |
| Systems Engineering Support | MIPR | MITRE : Bedford, MA | 4.717 | 0.515 | Dec 2015 | 0.905 | Nov 2016 | 0.638 | Dec 2017 | - | | 0.638 | Continuing | Continuing | Continuing |
| Government Engineering Support TTNT | WR | SSC : San Diego, CA | 2.295 | 4.355 | Dec 2015 | 1.506 | Jan 2017 | 1.050 | Nov 2017 | - | | 1.050 | Continuing | Continuing | Continuing |
| Govt Program Support NIFC-CA | WR | NAVAIR : Pax River, MD | 0.939 | 0.000 | | 0.000 | | 0.000 | Nov 2017 | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems/Software Engineering Suppt | C/CPFF | G2 : San Diego, CA | 0.488 | 0.173 | Feb 2016 | 0.000 | | 0.000 | Apr 2018 | - | | 0.000 | Continuing | Continuing | Continuing |
| COR and Logistics Support | WR | SSC : Charleston, SC | 0.000 | 0.000 | | 0.076 | Jan 2017 | 0.080 | Nov 2017 | - | | 0.080 | 0.000 | 0.156 | - |
| Information Assurance | MIPR | NSA : Fort Meade, MD | 0.000 | 0.000 | | 0.036 | Dec 2016 | 0.030 | Dec 2017 | - | | 0.030 | 0.000 | 0.066 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3020 / *MIDS/JTRS* | |

**Management Services ($ in Millions)**

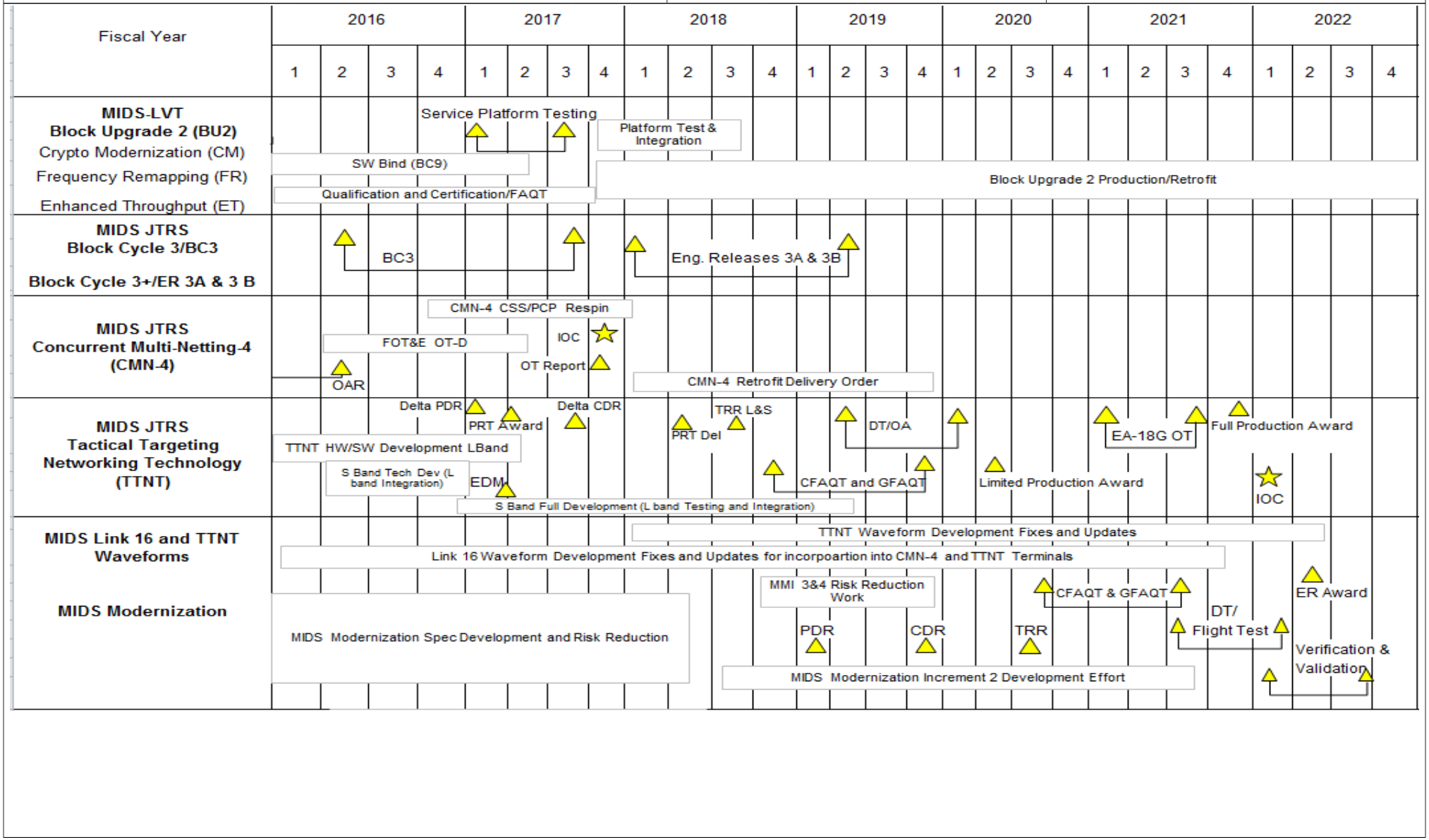
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering/ Programmatic Support | C/CPFF | Sentek : San Diego, Ca | 0.000 | 0.000 | | 0.604 | Nov 2016 | 0.425 | Dec 2017 | - | | 0.425 | 0.000 | 1.029 | - |
| ARL SIPRNET Connection | MIPR | ARL : Adelphi, MD | 0.000 | 0.000 | | 0.096 | Dec 2016 | 0.099 | Dec 2017 | - | | 0.099 | 0.000 | 0.195 | - |
| Contractor Program Management and Financial Support | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.704 | Jun 2017 | 0.333 | Jan 2018 | - | | 0.333 | 0.000 | 1.037 | - |
| | | **Subtotal** | 9.640 | 5.043 | | 3.927 | | 2.655 | | - | | 2.655 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 182.944 | 68.048 | | 57.406 | | 50.285 | | - | | 50.285 | - | - | - |

**Remarks**

In accordance with the ADM dated 11 July 2012, the Joint Tactical Radio Systems Programs of Record (JTRS PORs) transitioned to a Military Department-managed program.
MIDS transitioned to the Navy under PE 0205604N but was formerly in PE 0604280N.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***MIDS*** | | | | |
| MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Qualification and Certification/FAQT | 1 | 2016 | 4 | 2017 |
| MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Software Bind (SW) | 1 | 2016 | 2 | 2017 |
| MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Service Platform Testing | 1 | 2017 | 3 | 2017 |
| MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Block Upgrade 2 Production/Retrofit | 4 | 2017 | 4 | 2022 |
| MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Platform Test and Integration | 4 | 2017 | 3 | 2018 |
| MIDS JTRS Block Cycle 3 (BC3): BC3 | 2 | 2016 | 3 | 2017 |
| MIDS JTRS Block Cycle 3 (BC3): Block Cycle 3+ (ER 3A & 3B) | 1 | 2018 | 2 | 2019 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): OA Data and T&E/OAR | 1 | 2016 | 2 | 2016 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): Full Operational Test and Eval OT-D | 2 | 2016 | 2 | 2017 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): OT Report | 4 | 2017 | 4 | 2017 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): IOC (Initial Operational Capability) | 4 | 2017 | 4 | 2017 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): CMN-4 Retrofit Delivery Order | 1 | 2018 | 4 | 2019 |
| MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): CMN-4 CSS/PCP Respin | 4 | 2016 | 1 | 2018 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): TTNT Hardware/ Software Development (L Band) | 1 | 2016 | 2 | 2017 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): S Band Technology Development (L Band Integration) | 2 | 2016 | 1 | 2017 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Delta Preliminary Design Review | 1 | 2017 | 1 | 2017 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Engineering Design Model | 1 | 2017 | 1 | 2017 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Delta Critical Design Review | 3 | 2017 | 3 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): S Band Full Development (L Band Testing and Integration) | 4 | 2016 | 2 | 2019 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): PRT Award | 2 | 2017 | 2 | 2017 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): PRT Deliveries | 2 | 2018 | 2 | 2018 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): CFAQT and GFAQT | 4 | 2018 | 4 | 2019 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): TTNT Technolgy Readiness Review (TRR) | 3 | 2018 | 3 | 2018 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Operational Assessment | 2 | 2019 | 1 | 2020 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Limited Production | 2 | 2020 | 2 | 2020 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): EA-18G Operational Testing (OT) | 1 | 2021 | 3 | 2021 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): IOC (Initial Operational Capability) | 1 | 2022 | 1 | 2022 |
| MIDS JTRS Tactical Targeting Networking Technology (TTNT): Full Production Award | 4 | 2021 | 4 | 2021 |
| MIDS Link 16 and TTNT Waveform: Link 16 Waveform Development Fixes and Updates | 1 | 2016 | 4 | 2021 |
| MIDS Link 16 and TTNT Waveform: TTNT Waveform Development Fixes and Updates | 1 | 2018 | 2 | 2022 |
| MIDS Modernization: MIDS Modernization Spec Development | 1 | 2016 | 2 | 2018 |
| MIDS Modernization: MIDS Modernization Inc 2 (Air Dominance Assured Communications) | 2 | 2016 | 2 | 2018 |
| MIDS Modernization: MIDS Modernization Inc 2 Full Development Effort | 3 | 2018 | 3 | 2021 |
| MIDS Modernization: MIDS Mod Inc 2 CFAQT & GFAQT | 3 | 2020 | 3 | 2021 |
| MIDS Modernization: MIDS Mod Inc 3 and Inc 4 Risk Reduction Work | 4 | 2018 | 4 | 2019 |
| MIDS Modernization: MIDS Mod PDR | 1 | 2019 | 1 | 2019 |
| MIDS Modernization: MIDS Mod CDR | 4 | 2019 | 4 | 2019 |
| MIDS Modernization: MIDS Mod TRR | 3 | 2020 | 3 | 2020 |
| MIDS Modernization: MIDS Mod DT/Flight test | 3 | 2021 | 1 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3020 / *MIDS/JTRS* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| MIDS Modernization: MIDS Mod Verification and Validation | 1 | 2022 | 3 | 2022 |
| MIDS Modernization: MIDS Mod Engineering Release (Post DT) | 2 | 2022 | 2 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3341 / *Network Tactical Common Data Link* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3341: *Network Tactical Common Data Link* | 31.173 | 26.364 | 29.384 | 16.229 | - | 16.229 | 23.969 | 54.059 | 33.495 | 6.393 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Network Tactical Common Data Link (NTCDL) provides the ability to transmit/receive real-time Intelligence, Surveillance, and Reconnaissance (ISR) data simultaneously from multiple sources (surface, airborne, sub-surface, man-portable), and exchange command and control information (voice, data, imagery, and Full Motion Video) across dissimilar Joint, Service, Coalition, and civil networks. NTCDL provides warfighters with the capability to support multiple, simultaneous, networked operations with currently fielded Common Data Link (CDL)-equipped platforms (e.g. F/ A-35, P-3, and MH-60R), in addition to next generation manned and unmanned platforms (e.g., P-8, Triton, UCLASS, and Fire Scout). NTCDL is a incremental capability (surface, airborne, sub-surface, man-portable) providing a modular, scalable, multiple-link networked communications. NTCDL benefits the fleet by providing horizon extension for line-of-sight sensor systems for use in time critical strike missions. NTCDL counters Anti-Access/Area Denial (A2/AD) through its relay capability, and supports Tasking Collection Processing Exploitation Dissemination (TCPED) through its ISR networking capability. Additionally, NTCDL supports Humanitarian Assistance/Disaster Relief (HA/DR) efforts through its ability to share ISR data across dissimilar Joint, Service, Coalition, and Civil organizations.

FY18 request is for NTCDL product development, to include the development of two (2) NTCDL Engineering Development Models (EDMs) and associated software.

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access Area Denial (A2AD). With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document (ICD) and the JALN-M Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) waveform (Navy Multiband Terminal (NMT)) for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, Positioning, Navigation, and Timing (PNT) efforts related to the JALN-M Pod will develop a prototype PNT subsystem that will be integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global Positioning System (GPS) connectivity. Because the Pod is being designed to operate in an A2AD environment, the Pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via ADNS. ADNS is the method by which Tactical Navy units transfer Internet Protocol (IP) data to Navy and Department of Defense communities on the Global Information Grid (GIG).

FY18 efforts will focus on execution of the JALN-M demonstration flight tests.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Network Tactical Common Data Link (NTCDL) | 13.213 | 15.368 | 15.729 | 0.000 | 15.729 |
| ***Articles:*** | - | 2 | - | - | - |

***Description:*** NTCDL is the only High Data Rate, Line of Sight solution delivering ISR, sensor control information and UAS command and control. NTCDL uses Joint DoD specifications for CDL waveforms and line of sight network across the allocated CDL frequency spectrum. New technical specifications require increasing number of simultaneous CDL links to support increasing number of CDL/ISR platforms and missions.

***FY 2016 Accomplishments:***
Conducted Milestone B (MS B) and awarded the NTCDL Contract, to include procurement of long lead hardware in support of Engineering Development Models (EDM) software configuration items. Continued development of the Government Furnished Software (GFS), which includes the major software configuration items link management and user interface. Completed updating the CARD and PLCCE; and completed development of the initial Acquisition Program Baseline (APB). Conducted System Engineering Technical Review (SETR) events, including the In Process Review (IPR) for the initial GFS Build 1 (e.g., GFS IPR 1) required to support contract award. Completed the MS B Lifecycle Sustainment Plan (LCSP) and began development on the Navy Training Systems Plan (NTSP).

***FY 2017 Plans:***
Conduct post contract award activities, to include Post Award Conference (PAC). Conduct Initial Baseline Review (IBR) between vendor and system engineers to integrate the Government and Contractor master schedules, and finalize the developmental Integrated Master Schedule (IMS). Commence Earned Value Management (EVM) reporting. Continue system engineering, conduct a Preliminary Design Review (PDR) with the vendor to assess development progress and review and approve an initial engineering product baseline. Initiate development of the Engineering Development Models (EDMs), including 2 hardware systems and the contractor-developed software. Continue developing the link management and user interface Government Furnished Software (GFS); conduct an In Process Review (IPR) for delivery of GFS Build 2 required to support the PDR. Conduct system engineering efforts to support NTCDL development, integration and internal/external software interface management. Develop test plans to support future developmental tests and operational assessment (DT/OA).

***FY 2018 Base Plans:***
Conduct Critical Design Review (CDR) with the vendor to assess development progress and review and approve the final engineering product baseline. Continue development of the Engineering Development Models (EDMs), including 2 hardware systems and the contractor-developed software. Continue development of the link

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| management and user interface Government Furnished Software (GFS); and conduct a Test Readiness Review (TRR) for delivery of GFS Build 3 required to support commencement of formal testing. Complete the Test and Evaluation Master Plan (TEMP), continue development of test plans to support future developmental tests and operational assessment (DT/OA), and update to the Capabilities Production Document (CPD).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB)<br>***Articles:***<br>***Description:*** Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB) efforts will support Joint Aerial Layer Network-Maritime (JALN-M) System of Systems development, integration, and testing. Efforts will include the development of capabilities to integrate shipboard NTCDL terminals with the HCB in an Anti-Access/Area Denial (A2/AD) environment.<br>***FY 2016 Accomplishments:***<br>Continued support of JALN-M System of Systems (SoS) development, Integration & and Testing, and FY18 demonstration flight test planning. Efforts included design, development, procurement, integration, and testing the High Capacity Backbone (HCB) distributed system of systems SoS and the HCB component functional capabilities, interfaces, and supporting elements. Efforts included planning and the execution of the JALN-M demonstration flight test scheduled in FY18.<br>***FY 2017 Plans:***<br>FY17 efforts include delivery of the HCB terminals, completing development of Pod, MGEP, ship terminal, and continuing subsystem integration and test. Continue efforts that will include development associated with Increment 2, to include, airborne terminal research and development of High Capacity Backbone (HCB) and air-to-air relay activities in an Anti- Access/Area Denial (A2/AD) environment. Participate in integration and testing of JALN-M Pod components or sub-systems. Support planning and execution of the JALN-M flight tests.<br>***FY 2018 Base Plans:***<br>FY18 efforts include HCB subject matter experts (SMEs) to support the JALN-M flight tests execution.<br>***FY 2018 OCO Plans:***<br>N/A | 13.151<br>- | 14.016<br>- | 0.500<br>- | 0.000<br>- | 0.500<br>- |
| **Accomplishments/Planned Programs Subtotals** | 26.364 | 29.384 | 16.229 | 0.000 | 16.229 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 2950: *Network Tactical Common Data Link (CDL)* | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.057 | 21.699 | 0.000 | 21.756 |

**Remarks**

**D. Acquisition Strategy**

NTCDL will utilize the evolutionary acquisition approach for: surface, air, sub-surface, man-portable.

**E. Performance Metrics**

Conformance to meet Joint Interoperability Test Command (JITC) Certification requirements for CDL waveforms.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3341 / *Network Tactical Common Data Link* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NTCDL Product Development | C/CPIF | BAE Systems, Int : Wayne, NJ | 0.000 | 9.744 | Sep 2016 | 6.289 | Nov 2016 | 6.644 | Nov 2017 | - | | 6.644 | Continuing | Continuing | Continuing |
| NTCDL HCB Development | C/CPFF | SPAWARSYSCTR : San Diego, CA | 1.200 | 2.003 | Jul 2016 | 2.190 | Nov 2016 | 0.500 | Nov 2017 | - | | 0.500 | 0.000 | 5.893 | - |
| NTCDL HCB Development | C/CPFF | MIT/Lincoln Lab : Lexington, MA | 4.000 | 5.556 | Nov 2015 | 11.829 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 21.385 | - |
| NTCDL HCB Development | C/CPFF | DTIC : Fort Belvoir, VA | 0.000 | 2.104 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.104 | - |
| NTCDL Software Development | WR | SPAWARSYS : San Diego, CA | 0.000 | 1.415 | Nov 2015 | 1.659 | Nov 2016 | 1.740 | Nov 2017 | - | | 1.740 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.200 | 20.822 | | 21.967 | | 8.884 | | - | | 8.884 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NTCDL Systems Engineering | WR | SPAWARSYSCTR : San Diego, CA | 11.781 | 1.384 | Apr 2016 | 1.240 | Nov 2016 | 1.051 | Oct 2017 | - | | 1.051 | Continuing | Continuing | Continuing |
| NTCDL Systems Engineering | C/IDIQ | SPAWARSYS : San Diego, CA | 6.492 | 2.494 | Nov 2015 | 2.604 | Nov 2016 | 2.731 | Nov 2017 | - | | 2.731 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 18.273 | 3.878 | | 3.844 | | 3.782 | | - | | 3.782 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NTCDL Test and Evaluation | WR | SPAWARSYSCTR : San Diego, CA | 3.267 | 0.898 | Feb 2016 | 1.729 | Oct 2016 | 1.563 | Oct 2017 | - | | 1.563 | Continuing | Continuing | Continuing |
| NTCDL Test and Review | MIPR | JITC : Fort Huachuca, AZ | 0.200 | 0.299 | Jan 2016 | 0.576 | Dec 2016 | 0.604 | Dec 2017 | - | | 0.604 | Continuing | Continuing | Continuing |
| NTCDL Waveform certification | MIPR | COMOPTEVFOR : Norfolk, VA | 0.200 | 0.060 | Jan 2016 | 0.115 | Dec 2016 | 0.122 | Dec 2017 | - | | 0.122 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205604N / *Tactical Data Links* | Project (Number/Name)<br>3341 / *Network Tactical Common Data Link* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 3.667 | 1.257 | | 2.420 | | 2.289 | | - | | 2.289 | - | - | - |

**Management Services ($ in Millions)**

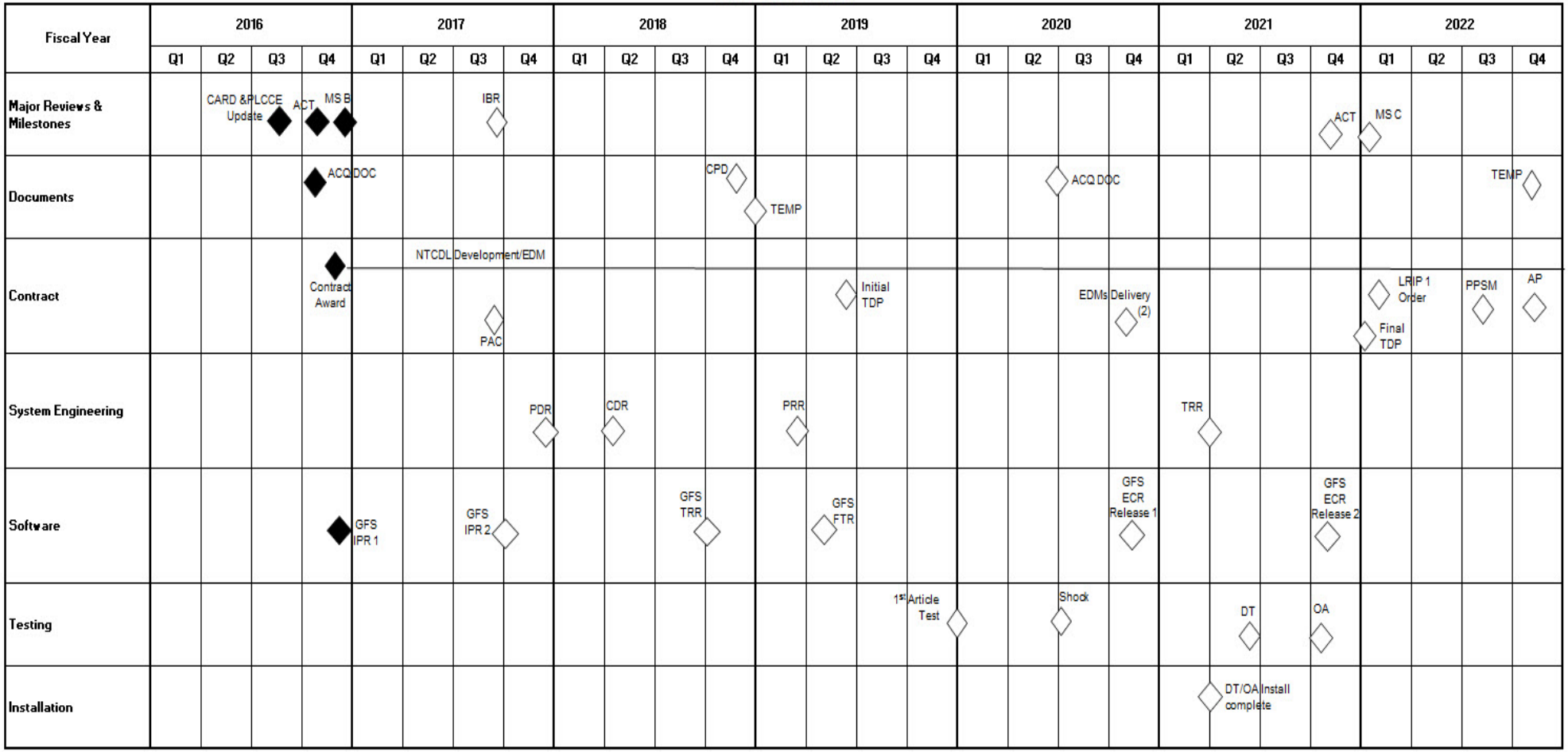
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | WR | SPAWARSYSCTR : San Diego, CA | 1.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.000 | - |
| Program Management Support | C/CPFF | BAH : San Diego, CA | 3.033 | 0.407 | Nov 2015 | 1.153 | Nov 2016 | 1.274 | Nov 2017 | - | | 1.274 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 4.033 | 0.407 | | 1.153 | | 1.274 | | - | | 1.274 | - | - | - |

| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 31.173 | 26.364 | | 29.384 | | 16.229 | | - | | 16.229 | - | - | - |

**Remarks**

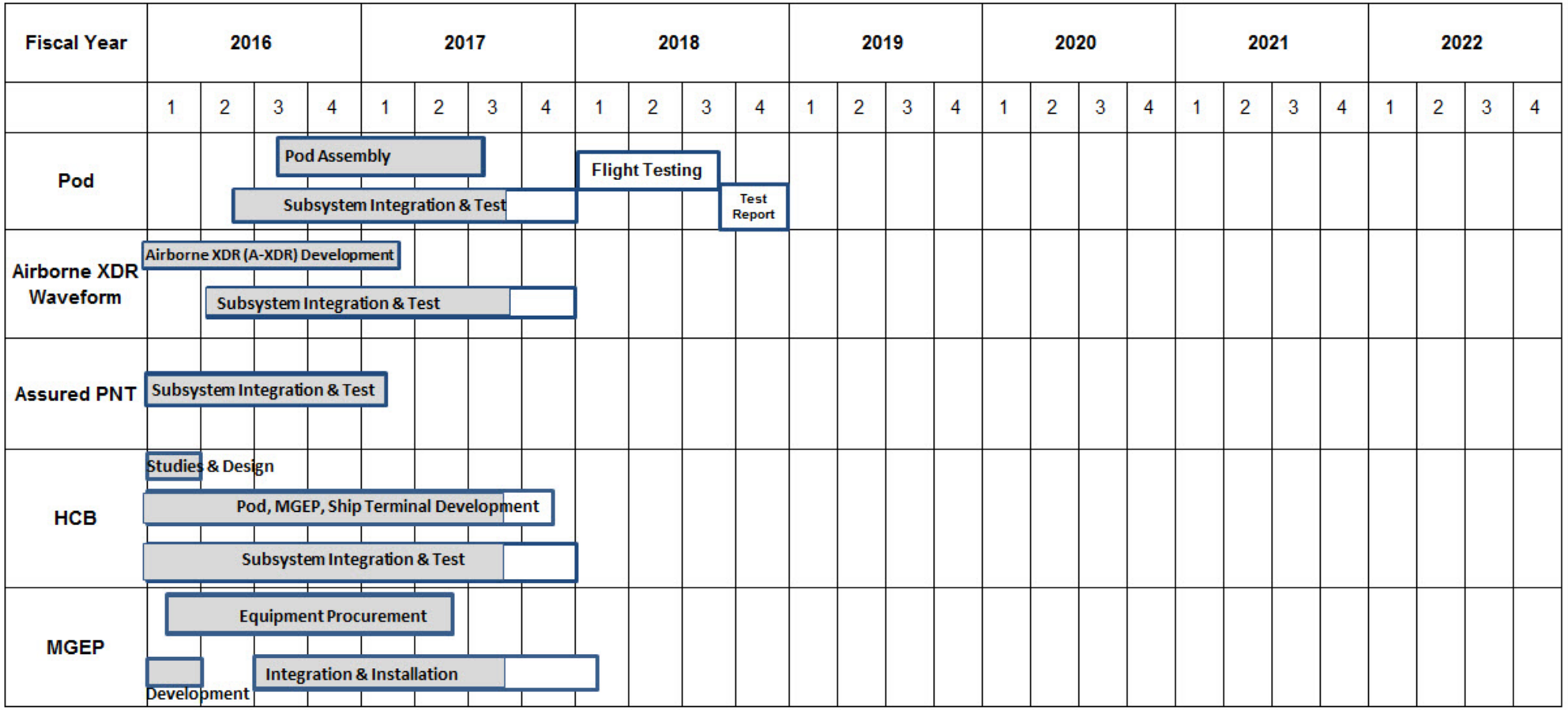
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

NTCDL Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

## JALN-M Demonstration



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205604N / *Tactical Data Links* | **Project (Number/Name)**<br>3341 / *Network Tactical Common Data Link* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 3341*** | | | | |
| NTCDL - Milestone B | 4 | 2016 | 4 | 2016 |
| NTCDL - Contract Award | 4 | 2016 | 4 | 2016 |
| NTCDL - Development Contract | 4 | 2016 | 4 | 2022 |
| NTCDL - Preliminary Design Review (PDR) | 4 | 2017 | 4 | 2017 |
| NTCDL - Critical Design Review (CDR) | 2 | 2018 | 2 | 2018 |
| NTCDL - Capability Production Document (CPD) | 4 | 2018 | 4 | 2018 |
| NTCDL - First Article Test | 1 | 2020 | 1 | 2020 |
| NTCDL - Development Testing (DT) | 2 | 2021 | 2 | 2021 |
| NTCDL - Operational Assessment (OA) | 4 | 2021 | 4 | 2021 |
| NTCDL - Milestone C | 1 | 2022 | 1 | 2022 |
| NTCDL - Low Rate Initial Production (LRIP) Order | 1 | 2022 | 1 | 2022 |
| JALN HCB Studies and Design | 1 | 2016 | 1 | 2016 |
| JALN HCB Integrated Testing | 1 | 2016 | 4 | 2017 |
| JALN HCB Development | 1 | 2016 | 4 | 2017 |
| JALN HCB Flight Testing | 1 | 2018 | 3 | 2018 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205620N *I Surface ASW Cmbt Sys Integr* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 216.279 | 23.685 | 24.583 | 29.351 | - | 29.351 | 28.945 | 30.213 | 29.892 | 30.407 | Continuing | Continuing |
| 1916: *Surface ASW System Improvement* | 216.279 | 23.685 | 24.583 | 29.351 | - | 29.351 | 28.945 | 30.213 | 29.892 | 30.407 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The objective of this Program Element (PE) is to significantly improve existing Surface Ship Undersea Warfare (USW) sonar system capabilities through quick and affordable development/integration of emergent, transformational technologies in support of Littoral Anti-Submarine Warfare (ASW), Theater ASW (TASW), and overall efforts required to pace the threat. Detection and classification play uniquely vital roles in the success of any ASW campaign. The Advanced Capability Build (ACB) spiral development process is the primary means by which these USW improvements are developed.

ASW remains a Navy core competency in a dynamic and uncertain maritime environment. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. Evolving submarine technologies offer enhanced stealth, speed, endurance, weapons, and operational proficiency, trends foretelling that the adversary submarine of the future will have a significantly larger sphere of influence, while presenting less vulnerability to ASW forces. The effective offensive engagement range of the adversary submarine of the future will continue to match or outrange individual U.S. and multinational platform sensors and weapons in many tactical environments. Submarines are an increasing threat to all Naval and Allied ships, particularly modern diesel subs and faster torpedoes. Not only can the presence of potential hostile submarines delay naval combatant action until they are located and neutralized, submarines can also disrupt all seaborne logistics supply for any ground campaign as well as maritime commerce. ASW forces must be effective in all operating environments, ranging from the deep open ocean to the littorals, and are key to countering adversarial anti-access and area denial strategies.

This project takes advantage of the AN/SQQ-89(V) Open System Architecture (OSA) and Acoustic Rapid Commercial-Off-The-Shelf (COTS) Insertion (ARCI) initiatives to integrate Torpedo Detection, Classification, and Localization (TDCL) and ASW sonar combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG and follow FLT I/II/IIA) class ships. The Open Architecture (OA) system enables the ACB process and provides budget flexibility to make COTS/OA technology solutions and ARCI-type initiatives affordable. Improvements are tested in the laboratory and at-sea.

This program will participate in, and take advantage of, the Tactical Advancements for the Next Generation (TANG) initiative that utilizes Commercial Industrial Design Thinking methodologies to engage the Fleet in generating innovative ASW improvement concepts.

ASW technology implementation will take advantage of improvements developed under the submarine Advanced Processing Build (APB) and Advanced Surveillance Build (ASB) programs and will in turn share unique improvements developed under this program with the submarine and surveillance ASW communities. All three programs (ACB, ASB, and APB) are managed under a common development organization and process titled AxB. While each platform retains its uniqueness and focus

in functional domains essential to mission success, a premium is placed on development of common capabilities and modular architecture technologies to maximize commonality and cost effectiveness.

This project will also contribute to the development of Littoral Combat Ship (LCS) ASW Mission Packages and the Frigate (FF) Program.

Project 1916 also includes funding for the Surface Ship Engineering Measurement Program (SSEMP), which will measure the performance of existing and new Surface Ship ASW combat systems and enables data-based assessment of the capabilities and shortfalls in the performance of these systems in realistic scenarios.

This project also includes funding to support cyber security initiatives to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 24.435 | 24.583 | 25.352 | - | 25.352 |
| Current President's Budget | 23.685 | 24.583 | 29.351 | - | 29.351 |
| Total Adjustments | -0.750 | 0.000 | 3.999 | - | 3.999 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.750 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 4.097 | - | 4.097 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.098 | - | -0.098 |

**Change Summary Explanation**

Funding:
FY 2016: Decrease by $-0.750M for Small Business Innovative Research (SBIR) realignment.
FY 2018: Net increase of $+3.999M for AN/SQQ-89A(V)15 Cyber Security upgrades/alignment ($4.200M) and NWCF rate adjustments, offset by Program Sponsor realignments to higher priorities and Naval Innovative Science & Engineering (NISE)/Section 219 increase.

YEAR-TO-YEAR OVERALL BUDGET CONTROL INCREASES/DECREASES:
- FY 2016 to FY 2017 increase ($+0.898M) representative of reasonable inflation escalation associated with the RDT&E,N appropriation coupled with the initiation of Common Sonar Tactical Decision Aid (STDA) development.
- FY 2017 to FY 2018 increase ($+4.768M) due initiation of cyber security capability development to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems, the initiation of studies on STDA Next Generation hardware and software architectures with the goals of virtualization and cyber hardening in conjunction with the incorporation of Bipartisan Budget Act (BBA) reduction to FY 2017.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205620N *I Surface ASW Cmbt Sys Integr* |

Schedule:
ACB development is now reflected as a continuous pipeline/conveyor process, conducted in parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies.

ACB-15 At-Sea Test has shifted from 1Q17 to 3Q17 due to test ship availability. This shift does not delay delivery to system integrator.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | Project (Number/Name)<br>1916 / *Surface ASW System Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1916: *Surface ASW System Improvement* | 216.279 | 23.685 | 24.583 | 29.351 | - | 29.351 | 28.945 | 30.213 | 29.892 | 30.407 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Surface ASW Systems Improvements Project will support essential performance enhancements to AN/SQQ-89(V) and Surface Ship Sonar Systems. This project will improve AN/SQQ-89(V) Measures of Performance (MOP) by enhancing operator interface methods and tools, active and passive detection, tracking, classification and localization, torpedo DCL, and sonobuoy data processing and display capabilities, and increasing acoustic sensor frequency bandwidth (Operational Requirements Document #667-76-05 titled 'AN/SQQ-89 Improvement Program'), Test & Evaluation Master Plan (TEMP) 802-2.

This project will take advantage of the TANG initiative, AN/SQQ-89(V) OSA, and ARCI initiatives to integrate a TDCL and ASW sonar and combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG51 and follow FLT I/II/IIA) class ships. This project has delivered the AN/SQQ-89A(V)15 Pre-Production Prototype, performed installation on board CG73, and conducted subsequent Developmental Test & Evaluation (DT&E) and Initial Operational Test & Evaluation (IOT&E) where the system was found 'Operationally Effective' by Command Operational Test and Evaluation Force (COMOPTEVFOR).

The OSA and high performance COTS processing hardware on ships fielded with the AN/SQQ-89A(V)15 combat system provides an opportunity to integrate emergent, transformational ASW technological improvements that were previously unachievable. The USW suites on these ships will require periodic upgrades to remain effective well into the 21st century and to pace the threat. Software upgrades target capability increases in high interest areas as prescribed by the Fleet and captured in campaign analysis. To achieve this, this project will package and deliver incremental upgrades every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-13, ACB-15, etc.) by inserting maturing USW technologies.

Primary areas of USW improvement are as follows:
- Medium Frequency (MF) Pulsed Active Sonar
- Continuous Active Sonar (CAS)
- MF Acoustic Communications
- TDCL
- Torpedo Defense
- Passive Sonar
- Sonar Tactical Decision Aids (STDA)

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** AN/SQQ-89A(V)15 Surface Ship ASW Advanced Capability Build (ACB) Development | 19.785 | 20.683 | 21.251 | 0.000 | 21.251 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop enhancements to the AN/SQQ-89A(V)15 Open System Architecture (OSA) via the integration of transformational technologies through the four step ACB spiral development process, enhanced by the TANG initiative. These items will be integrated and delivered to the CG47 and DDG51 class AN/SQQ-89A(V)15 backfit production programs via ACB updates.<br><br>The ACB four step process:<br>Step 1 - algorithm/technology assessment by peer review panels of Subject Matter Experts (SME) to down-select technologies and assist developers with technical guidance.<br>Step 2 - algorithm/technology testing with open and closed data sets to further down-select and refine capabilities prior to integration and testing.<br>Step 3 - land based system-level testing in a realistic tactical environment.<br>Step 4 - at-sea testing on an operational surface combatant. Step 4 is conducted only if an appropriate platform is available.<br><br>ACB requirements are generated through discussions with the Fleet, then vetted and provided as direction by CNO, N96. Beginning in FY 2017, Steps 1 and 2 will be conducted in a pipeline style parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies. The content of a specific ACB build (every two years on the odd year) will then be determined through a series of discussions with the Fleet aimed at selecting the most relevant and mature technologies available in the ACB pipeline. Integration at the String and System level will then be performed followed by Steps 3 and 4, as applicable, and transitioned to production.<br><br>Additionally, import advanced development capabilities from the submarine APB and ARCI projects. Export advanced capabilities to submarine and surveillance combat system programs. Resolve/troubleshoot issues/deficiencies that arise from the AN/SQQ-89(V) Surface Ship ASW Test & Evaluation program. Rapidly address and correct problems/deficiencies in processing, capability or operations within the following areas within the AN/SQQ-89(V) USW combat system architecture; sensor processing, acoustics, fire control, contact management, performance prediction, operator productivity and on-board training, Multi-Function Towed Array (MFTA), Digital Fire Control Interface (DFCI), MFA processing, TDCL, Torpedo Defense and adaptive beamforming. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Completed development and integration of enhancements to the AN/SQQ-89A(V)15 for ACB-15. Conducted Step 3 land-based testing of full tactical system which tested individual capability and system performance of ACB-15. Initiated development of concepts and capabilities for ACB-17 including improvements to Active Sonar, Torpedo Detection, Contact Followers/tracking, on-board training videos, cyber protection/Information Assurance (IA) and a new environmental status board. Conducted independent Step 2 testing of ACB-17 individual technologies. | | | | | |
| ***FY 2017 Plans:***<br>- Conduct Step-4 at-sea testing of ACB-15. Transition ACB-15 to production.<br>- Continue development and integration of enhancements to the AN/SQQ-89A(V)15 for ACB-17. Conduct system integration and Step 3 land-based testing of ACB-17. Transition ACB-17 to production.<br>- Initiate planning and development of capabilities for ACB-19.<br>- Conduct Step 1 and Step 2 testing of capabilities under development.<br>- Support conduct of TANG events.<br>- Initiate Common STDA development. Currently, submarine, surface and surveillance programs each develop, field and maintain similar but unique STDA products. The Common STDA development is intended to reduce future year development costs, by containing development efforts within one common system architecture and sharing of capability increases. Life cycle STDA costs will also decrease as one baseline, rather than three, is documented, maintained and trained on. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue development and integration of enhancements to the AN/SQQ-89A(V)15 for ACB-19. Anticipate developing improvements to implement passive tracking improvements from submarine APB; implement Active Sonar Automation improvements from Office of Naval Research (ONR); implement Doppler Clutter Reduction; implement a modern classifier for CAS; implement Synthetic Aperture Sonar from Naval Research Laboratory (NRL); implement a CAS mode for Torpedo Defense; and implement improved sonobuoy processing.<br>- Conduct system integration and commence Step 3 land-based testing of ACB-19.<br>- Support conduct of TANG events.<br>- Continue Common STDA development and initiate studies on Next Generation hardware and software architectures with the goals of virtualization and cyber hardening. Virtualization is intended to reduce software integration costs while increasing flexibility. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** AN/SQQ-89(V) Surface Ship ASW Test & Evaluation Program | 0.700 | 0.700 | 0.700 | 0.000 | 0.700 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Supported final ACB-11 Initial Operational Test & Evaluation (IOT&E) events. Finalized test ship and resources in support of ACB-13 Developmental Test & Evaluation (DT&E). Supported conduct of AEGIS Integration Events (AIE) for ACB-13 certification. | | | | | |
| ***FY 2017 Plans:***<br>- Finalize ACB-13 Test & Evaluation Master Plan (TEMP).<br>- Begin conduct of ACB-13 Developmental Test (DT) events.<br>- Finalize test ship and resources in support of ACB-13 Operational Test (OT).<br>- Support conduct of AIE for ACB-15 certification. Work test ship and resources in support of ACB-15 DT&E and ACB-15 TEMP. | | | | | |
| ***FY 2018 Base Plans:***<br>- Begin conduct of ACB-13 OT events.<br>- Continue AIE to support ACB-17 certification.<br>- Finalize test ship and resources in support of ACB-15 OT. Finalize ACB-15 TEMP. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Surface Ship Enhanced Measurement Program (SSEMP) | 3.200 | 3.200 | 3.200 | 0.000 | 3.200 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Analyze the sonar employment in the operational setting and report results for improvement of training/employment guidance. Perform Fleet exercise data reconstruction and post-test analysis each year. Conduct selected at-sea data collection activities by providing planning support, ship riders, and analyst support. Evaluate prototype sonar employment tactics, sonar processing and automation algorithms, and communication protocols for the detection, classification, tracking, and intra-Fleet hand-off to Fleet ASW assets, and provide summary reports to document results. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Commenced planning for ACB-11/ACB-13 Level 4 Operator Test. Supported analysis of ACB-13/ACB-15 Return-On-Investment (ROI) test. Conducted analysis of three real-world SSEMP cases and additional exercise data. Supported COMOPTEVFOR as trusted agent to conduct ACB-11 OT analysis. Updated lab hardware to support ACB-13 install on TI-14 hardware.<br>***FY 2017 Plans:***<br>- Complete ACB-11/ACB-13 Level 4 Operator Test analysis.<br>- Support ACB-13 IOT&E/OT data collection and analysis of operational performance.<br>- Continue analysis of real-world SSEMP cases and exercise performance data.<br>***FY 2018 Base Plans:***<br>- Continue support of ACB-13 IOT&E/OT data collection and analysis of operational performance.<br>- Support ACB-15 IOT&E/OT data collection and analysis of operational performance.<br>- Continue analysis of real-world SSEMP cases and exercise performance data.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AN/SQQ-89A(V)15 Cyber Security Architecture Upgrade | 0.000 | 0.000 | 4.200 | 0.000 | 4.200 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Align with system design plans with the Program Executive Office (PEO) Integrated Warfare Systems (IWS) Cyber Security Instruction 5239.1, incorporate support architecture changes required to meet the current cyber security requirements defined in the Risk Management Framework (RMF), and incorporate capabilities to better align with the Defense-In-Depth Functional Implementation Architecture (DFIA) and Information Assurance (IA) Technical Authority Board Implementation Standards.<br>- Initiate development of cyber security capabilities into AN/SQQ-89A(V)15 Technical Insertion (TI) baselines to support emergent cyber security requirements. These TI's will interface with various Aegis Weapon System (AWS) baselines. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate development of cyber security capabilities into Advance Capability Builds (ACB) to support emergent cyber security requirements.<br>- Initiate efforts to modernize existing software to reduce the cyber security risks to the weapons control component of the system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 23.685 | 24.583 | 29.351 | 0.000 | 29.351 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2136: *AN/SQQ-89 Surface ASW Combat System* | 103.241 | 90.029 | 102.050 | - | 102.050 | 123.284 | 124.400 | 127.426 | 135.030 | Continuing | Continuing |
| • RDTEN/0603553N/1704: *Undersea Warfare* | 1.056 | 1.081 | 1.136 | - | 1.136 | 1.159 | 1.183 | 1.206 | 1.231 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

- Via an ACB spiral development process, incorporate evolutionary and transformational technologies into AN/SQQ-89A(V)15 production systems.
- Utilize the Small Business Innovative Research (SBIR) program and full and open competition for new and improved innovative capability development.

**E. Performance Metrics**

- Deliver incremental capability increases in high interest areas, as prescribed by the Fleet and captured in campaign analysis, every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-09, ACB-11, ACB-13, etc.) by inserting maturing USW technologies.
- Conduct system qualification testing (SQT) and AEGIS Integration Events (AIE) for all fielded variants of ACB.
- Utilize the SSEMP to evaluate performance of fielded systems.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SQQ-89 S/W Development/Integration | C/CPFF | AAC : NY | 6.238 | 0.267 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.505 | - |
| SQQ-89 S/W Development/Integration | C/CPFF | Alion : IL | 5.663 | 1.250 | Nov 2015 | 0.915 | Nov 2016 | 1.250 | Dec 2017 | - | | 1.250 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | Adaptive Methods : VA | 14.675 | 0.150 | Dec 2015 | 0.575 | Dec 2016 | 0.605 | Dec 2017 | - | | 0.605 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | GD-AIS : VA | 11.322 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.322 | - |
| SQQ-89 S/W Development/Integration | C/CPFF | In-Depth Engineering : VA | 2.975 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.975 | - |
| SQQ-89 S/W Development/Integration | C/CPFF | JHU/APL : MD | 27.560 | 4.317 | Dec 2015 | 6.059 | Nov 2016 | 6.100 | Dec 2017 | - | | 6.100 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | Metron : VA | 3.850 | 1.100 | Dec 2015 | 0.500 | Nov 2016 | 0.600 | Dec 2017 | - | | 0.600 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | Lockheed Martin : NY | 10.205 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.205 | - |
| SQQ-89 S/W Development/Integration | C/CPFF | Lockheed Martin : VA | 12.903 | 3.152 | Feb 2016 | 3.658 | Dec 2016 | 3.650 | Dec 2017 | - | | 3.650 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | WR | NSWC/Carderock : MD | 7.527 | 0.000 | | 0.250 | Jan 2017 | 0.250 | Nov 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | WR | NSWC/Dahlgren : VA | 1.440 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.440 | - |
| SQQ-89 S/W TDA Support | WR | NUWC/Newport : RI | 11.370 | 2.300 | Nov 2015 | 2.822 | Jan 2017 | 2.970 | Nov 2017 | - | | 2.970 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | Sedna Digital : VA | 4.300 | 0.000 | | 0.105 | Feb 2017 | 0.100 | Dec 2017 | - | | 0.100 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | UT/ARL : TX | 14.052 | 2.641 | Dec 2015 | 1.975 | Nov 2016 | 1.950 | Dec 2017 | - | | 1.950 | Continuing | Continuing | Continuing |
| SQQ-89 S/W Development/Integration | C/CPFF | VAR : VAR* | 20.995 | 2.800 | Dec 2015 | 3.516 | Dec 2016 | 3.468 | Dec 2017 | - | | 3.468 | Continuing | Continuing | Continuing |
| SAST Development/ Integration | C/CPFF | JHU/APL : MD | 8.302 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.302 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | Project (Number/Name)<br>1916 / *Surface ASW System Improvement* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAST Development/ Integration | WR | NSWC/Carderock : MD | 12.379 | 1.114 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 13.493 | - |
| SAST Development/ Integration | WR | NUWC/Newport : RI | 3.015 | 0.065 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.080 | - |
| SAST Development/ Integration | C/CPFF | Sedna Digital : VA | 4.897 | 0.105 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.002 | - |
| SAST Development/ Integration | C/CPFF | UT/ARL : TX | 1.652 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.652 | - |
| SAST Development/ Integration | C/CPFF | VAR : VAR* | 0.596 | 0.216 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.812 | - |
| SQQ-89 CyberSecurity Development/Integration | C/CPFF | Lockheed Martin : VA | 0.000 | 0.000 | | 0.000 | | 3.360 | Dec 2017 | - | | 3.360 | 0.000 | 3.360 | - |
| SQQ-89 CyberSecurity Development/Integration | WR | NSWC/Dahlgren : VA | 0.000 | 0.000 | | 0.000 | | 0.630 | Nov 2017 | - | | 0.630 | 0.000 | 0.630 | - |
| SQQ-89 CyberSecurity Development/Integration | WR | NUWC/Newport : RI | 0.000 | 0.000 | | 0.000 | | 0.210 | Nov 2017 | - | | 0.210 | 0.000 | 0.210 | - |
| | | **Subtotal** | 185.916 | 19.477 | | 20.375 | | 25.143 | | - | | 25.143 | - | - | - |

**Remarks**

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Note: SAST Development/Integration cost category is not used effective FY17. SAST was developed stand-alone, but has been integrated into the AN/SQQ-89 ACB baseline.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSEMP ConductTest/Data Evaluation | C/CPFF | JHU/APL : MD | 14.065 | 2.100 | Dec 2015 | 2.100 | Nov 2016 | 2.100 | Dec 2017 | - | | 2.100 | Continuing | Continuing | Continuing |
| SSEMP Conduct/Test/ Data Evaluation | WR | NUWC/Newport : RI | 3.412 | 0.500 | Nov 2015 | 0.500 | Jan 2017 | 0.500 | Nov 2017 | - | | 0.500 | Continuing | Continuing | Continuing |
| SSEMP Conduct/Test/ Data Evaluation | C/CPFF | UT/ARL : TX | 4.278 | 0.600 | Dec 2015 | 0.600 | Nov 2016 | 0.600 | Dec 2017 | - | | 0.600 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SQQ-89 IV&V/SAT/TEMP Assess./Update | WR | NUWC/Newport : RI | 2.426 | 0.400 | Nov 2015 | 0.400 | Jan 2017 | 0.400 | Nov 2017 | - | | 0.400 | Continuing | Continuing | Continuing |
| SQQ-89 DT/OT/ Miscellaneous T&E | WR | VAR : VAR* | 2.385 | 0.300 | Feb 2016 | 0.300 | Dec 2016 | 0.300 | Dec 2017 | - | | 0.300 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 26.566 | 3.900 | | 3.900 | | 3.900 | | - | | 3.900 | - | - | - |

**Remarks**

*Consists of multiple performing activities with funding for each not greater than $1M per year.

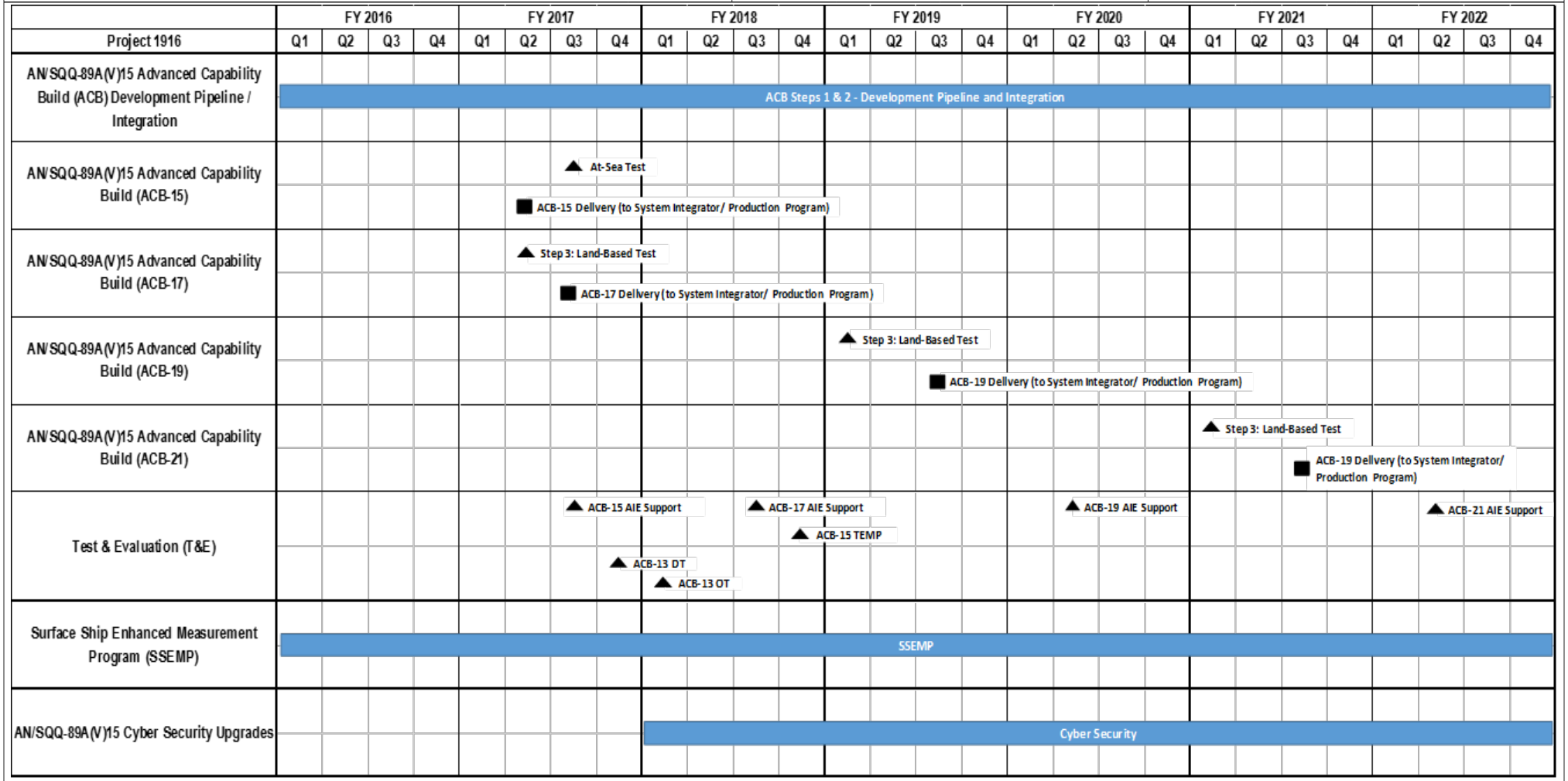
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | C/CPAF | BAE Systems : MD | 2.999 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.999 | - |
| Program Management Support | C/CPIF | CGI Federal : VA | 0.000 | 0.250 | Dec 2015 | 0.250 | Nov 2016 | 0.250 | Dec 2017 | - | | 0.250 | Continuing | Continuing | Continuing |
| Program Office Travel | Allot | NAVSEA PEO IWS5 : DC | 0.798 | 0.058 | Jan 2016 | 0.058 | Nov 2016 | 0.058 | Oct 2017 | - | | 0.058 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 3.797 | 0.308 | | 0.308 | | 0.308 | | - | | 0.308 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 216.279 | 23.685 | | 24.583 | | 29.351 | | - | | 29.351 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 1916*** | | | | |
| AN/SQQ-89A(V)15 Advanced Capability Build: AN/SQQ-89A(V)15 Advanced Capability Build Development Pipleline | 1 | 2016 | 4 | 2022 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 Step 4 At-Sea Test | 3 | 2017 | 3 | 2017 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 S/W Delivery to Integrator | 2 | 2017 | 2 | 2017 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 Step 3 Land-Based Test (LBT) | 2 | 2017 | 2 | 2017 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 S/W Delivery to Integrator | 3 | 2017 | 3 | 2017 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 Step 3 Land-Based Test (LBT) | 1 | 2019 | 1 | 2019 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 S/W Delivery to Integrator | 3 | 2019 | 3 | 2019 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 Step 3 Land-Based Test (LBT) | 1 | 2021 | 1 | 2021 |
| AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 S/W Delivery to Integrator | 3 | 2021 | 3 | 2021 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Developmental Test (DT) | 4 | 2017 | 4 | 2017 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Operational Test (OT) | 1 | 2018 | 1 | 2018 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Aegis Integration Event (AIE) | 3 | 2017 | 3 | 2017 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 T&E Master Plan (TEMP) | 4 | 2018 | 4 | 2018 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Aegis Integration Event (AIE) | 3 | 2018 | 3 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205620N / *Surface ASW Cmbt Sys Integr* | **Project (Number/Name)**<br>1916 / *Surface ASW System Improvement* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-19 Aegis Integration Event (AIE) | 2 | 2020 | 2 | 2020 |
| Test & Evaluation: AN/SQQ-89A(V)15 ACB-21 Aegis Integration Event (AIE) | 2 | 2022 | 2 | 2022 |
| Surface Ship Enhanced Measurement Program (SSEMP): Surface Ship Enhanced Measurement Program (SSEMP) | 1 | 2016 | 4 | 2022 |
| AN/SQQ-89A(V)15 Cyber Security Upgrades: AN/SQQ-89A(V)15 Cyber Security Upgrades | 1 | 2018 | 4 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205632N *I MK-48 ADCAP* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 253.140 | 47.496 | 39.134 | 68.553 | - | 68.553 | 95.983 | 90.256 | 112.798 | 115.061 | Continuing | Continuing |
| 0366: *MK 48 ADCAP* | 253.140 | 42.186 | 39.134 | 68.553 | - | 68.553 | 95.983 | 90.256 | 112.798 | 115.061 | Continuing | Continuing |
| 9999: *Congressional Adds* | 0.000 | 5.310 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.310 |

**A. Mission Description and Budget Item Justification**

MK-48 ADCAP (Advanced Capability) Research, Development, Test and Evaluation (RDT&E) program executes incremental development of weapon performance improvements in three development product areas: (1) Common Broadband Advanced Sonar System (CBASS), (2) Advanced Processor Builds (APBs), and (3) Torpedo Technology Insertion (TI). This Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia Armaments Cooperative Project (ACP) to develop MK-48 ADCAP CBASS; and Future Naval Capability (FNC) technologies developed by the Office of Naval Research (ONR).

Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The focus of the MK-48 ADCAP Torpedo Research and Development (R&D) program beginning FY 2001 shifted from concentrating primarily on software block upgrade efforts towards coordinated hardware upgrades, rapid Commercial-Off-the-Shelf (COTS) insertion, and APBs, in order to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The CBASS program developed and fielded a broadband sonar capable of identifying CMs and discriminating them from the target. CBASS Phase I achieved IOC in FY 2006. The Royal Australian Navy (RAN) is jointly participating to develop CBASS Phase II to improve shallow water performance and signed a Memorandum of Agreement (MOA) extension November 2009. The Memorandum Of Agreement (MOA) extension expires November 2019.

The MK-48 ADCAP Torpedo R&D program focuses on two specific areas near term; Torpedo APBs and hardware tech insertions. The CNO continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation, and testing of these changes are being accomplished under the Torpedo APB program. The APB program also leverages the RAN joint torpedo program and FNC technologies developed by the ONR in the areas of torpedo broadband signal processing, tactics processing, and alertment. The Torpedo tech insertion program will leverage the MK-54 Lightweight torpedo algorithms.

The Torpedo Technology Insertion program will provide for evolutionary torpedo improvements and upgrades (including the transition and testing of advanced technologies from the R&D community). This approach will incorporate developmental testing of the FNC transitioning technologies for ADCAP upgrades in the areas of torpedo sensors, weapon/platform connectivity, improve fusing, and an alternate method of homing. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.

The MK 48 MOD 7 APB6/TI-1 Heavyweight Torpedo (HWT) program is an evolutionary upgrade to the MK 48 MOD 7 HWT; it will consist of an Operational Software (OPSW) upgrade referred to as APB 6 and a hardware upgrade referred to as TI-1. TI-1 will include a Guidance and Control (G&C) section upgrade, a redesigned

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205632N *I MK-48 ADCAP* |

TI-1 Warhead Electronics System (WES), and an Improved Post Launch Communications System (IPLCS). TI-1 will also include features from three Future Naval Capabilities (FNC) programs: ASuW weapon upgrades, Extended Range Modular Undersea Heavyweight Vehicle (ER MUHV) and Torpedo Common Hybrid Fuzing System (Fuze).

APB5 software upgrades are currently in process for MK-48 ADCAP torpedoes.
APB5+ software upgrades are currently in process for MK-48 ADCAP torpedoes.

Both FNC technologies and MK-54 LWT developments will be transitioned into ADCAP through APBs and technology insertion packages. Priorities for APBs and technology insertion are: (1) improved torpedo effectiveness through advanced processing algorithms, (2) advanced counter-countermeasure capability, and (3) a new array to improve torpedo effectiveness.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 47.703 | 39.134 | 68.563 | - | 68.563 |
| Current President's Budget | 47.496 | 39.134 | 68.553 | - | 68.553 |
| Total Adjustments | -0.207 | 0.000 | -0.010 | - | -0.010 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.207 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.010 | - | -0.010 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2016 | FY 2017 |
|---|---|---|
| **Project:** 9999: *Congressional Adds* | | |
| Congressional Add: *Upgrade Program* | 5.310 | 0.000 |
| Congressional Add Subtotals for Project: 9999 | 5.310 | 0.000 |
| Congressional Add Totals for all Projects | 5.310 | 0.000 |

**Change Summary Explanation**

FY 2018: Additional funds are primarily due to the TI-1 Hardware development contract.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205632N / *MK-48 ADCAP* | Project (Number/Name)<br>0366 / *MK 48 ADCAP* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0366: *MK 48 ADCAP* | 253.140 | 42.186 | 39.134 | 68.553 | - | 68.553 | 95.983 | 90.256 | 112.798 | 115.061 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

MK48 ADCAP program executes incremental development of weapon performance improvements in two development product areas: (1) APBs, and (2) torpedo technology insertion. This program is tied to development programs that leverage a joint United States/Australia ACP to develop MK48 ADCAP and FNC technologies being developed by the ONR.

APB software upgrades will improve torpedo performance in challenging shallow water and countered environments through incorporation of new algorithms designed to address broadband, multiband, classifications and tactics processing changes. Hardware technology insertions will improve weapon performance against slow/low doppler targets. It provides improved target detection at long and short ranges and improved counter measure rejection in countered and shallow water scenarios.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TORPEDO APB | 24.557 | 26.711 | 47.567 | 0.000 | 47.567 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued APB 5 development.<br>Continued APB 5+ development.<br>Started APB 6 development.<br>Started transition of Fuze and ASuW FNC products to include requirement documentation to be completed, model updates, software integration, in-water and land-based testing, and performance matrix testing. | | | | | |
| ***FY 2017 Plans:***<br>Continue APB 5 software builds for DT<br>Continue APB 6 software development.<br>Award TI-1 (112 Element Array) Development Contract. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue APB 6 development.<br>Continue TI-1 development<br>Continue Weapons Analysis Facility (WAF) upgrades and accreditation.<br>Start Fiber development. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>0366 / *MK 48 ADCAP* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** TEST & EVALUATION | 17.629 | 12.423 | 20.986 | 0.000 | 20.986 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Started APB 5 Developmental Testing(DT); 4 major DT events with 73 firings over ~ 14 days at sea as well as follow-on analysis and reports for each event.<br>Continued Build-Test-Build development. | | | | | |
| ***FY 2017 Plans:***<br>Conduct APB 5 Developmental Testing (DT) in water events with analysis and reports for each event.<br>Continued build-test-build development. | | | | | |
| ***FY 2018 Base Plans:***<br>Begin APB 5 Operational Testing (OT) events OT-A and OT-B with analysis and reports for each event. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 42.186 | 39.134 | 68.553 | 0.000 | 68.553 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN/3225: *MK-48 Torpedo ADCAP Mods* | 56.730 | 46.139 | 38.954 | - | 38.954 | 40.599 | 41.374 | 58.685 | 59.866 | 0.000 | 1,425.338 |
| • WPN/3117: *MK-48 Torpedo* | 60.438 | 44.537 | 47.210 | - | 47.210 | 75.993 | 101.046 | 177.523 | 164.289 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Sole source production contract awarded in FY 2004 for MK48 ADCAP MODS, MK-54 LWT, and CBASS kits, including RAN units. A full and competitive procurement for MK48 MOD 7 CBASS production kits was awarded in March 2011 with a FY 2010/2011 base year and four option years for FY 2012-2015. A new FY 2016 competitive contract was awarded to continue procurement of CBASS Kits.

A new FY 2016 competitive contract was awarded to procure additional warshot torpedoes.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>0366 / *MK 48 ADCAP* |

**E. Performance Metrics**

Milestone reviews.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>0366 / *MK 48 ADCAP* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Software Development - Sprial 4 / PY Development | WR | NUWC NPT : Newport RI | 31.839 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 31.839 | - |
| Primary Software Development - APB 5 | WR | NUWC NPT : Newport RI | 8.340 | 13.112 | Oct 2015 | 11.024 | Oct 2016 | 5.552 | Oct 2017 | - | | 5.552 | Continuing | Continuing | Continuing |
| Primary Software Development - APB 6 | WR | NUWC NPT : Newport RI | 0.000 | 0.000 | | 0.000 | | 6.554 | Oct 2017 | - | | 6.554 | 0.000 | 6.554 | - |
| Primary Software Development - APB 6 | WR | MIT : Cambridge, Massachusetts | 0.000 | 0.000 | | 0.000 | | 0.000 | Mar 2018 | - | | 0.000 | 0.000 | 0.000 | - |
| Primary Hardware Development - Spiral 4 / PY Development | WR | NUWC NPT : Newport RI | 31.201 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 31.201 | - |
| Primary Hardware Development - TI-1 | WR | NUWC NPT : Newport RI | 7.755 | 7.125 | Jan 2016 | 4.546 | Oct 2016 | 9.369 | Oct 2017 | - | | 9.369 | Continuing | Continuing | Continuing |
| Primary Hardware Development - IM | WR | Indian Head : Indian Head | 0.450 | 0.450 | Jan 2016 | 0.450 | Oct 2016 | 0.450 | Jan 2018 | - | | 0.450 | Continuing | Continuing | Continuing |
| Primary Hardware Development - TI-1 | C/FFP | ARL/PSU : State College PA | 0.000 | 0.000 | | 0.000 | | 0.300 | Mar 2018 | - | | 0.300 | 0.000 | 0.300 | - |
| Primary Hardware Development - TI-1 | WR | Indian Head : Indian Head | 0.000 | 0.000 | | 0.000 | | 0.100 | Oct 2017 | - | | 0.100 | 0.000 | 0.100 | - |
| Hardware Development - TI-1 | C/CPFF | New - TBD : TBD | 0.000 | 0.000 | | 6.176 | Aug 2017 | 20.411 | Jun 2018 | - | | 20.411 | 0.000 | 26.587 | - |
| | | **Subtotal** | 79.585 | 20.687 | | 22.196 | | 42.736 | | - | | 42.736 | - | - | - |

**Remarks**

Funds torpedo, modeling and simulation hardware and software development, including the engineering and project manager's costs. FY 2018 increased funding provided for TI-1 development and hardware development contract award.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development - APB 5 | WR | NUWC NPT : Newport RI | 23.252 | 3.353 | Oct 2015 | 3.983 | Oct 2016 | 3.368 | Oct 2017 | - | | 3.368 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205632N / *MK-48 ADCAP* | Project (Number/Name)<br>0366 / *MK 48 ADCAP* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development - APB 6 | WR | NUWC NPT : Newport RI | 0.000 | 0.000 | | 0.000 | | 0.917 | Oct 2017 | - | | 0.917 | 0.000 | 0.917 | - |
| Software Development | Various | Various : Not Specified | 36.317 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Integrated Logistics Support | WR | NUWC NPT : Newport RI | 2.243 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering WCF | WR | NUWC NPT : Newport RI | 17.750 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Systems Engineering | Various | NUWC NPT : Newport RI | 0.676 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 80.238 | 3.353 | | 3.983 | | 4.285 | | - | | 4.285 | - | - | - |

**Remarks**

Funds activity program support costs, post test and evaluation weapons analysis, and Weapons Analysis Facilities (WAF) costs. Small increase in FY 2018 for APB 6 software development analysis.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test & Evaluation - Spiral 4 / PY | WR | NUWC NPT : Newport RI | 17.086 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 17.086 | - |
| Test & Evaluation - APB 5 | WR | NUWC NPT : Newport RI | 3.918 | 5.418 | Oct 2015 | 3.183 | Oct 2016 | 10.749 | Oct 2017 | - | | 10.749 | Continuing | Continuing | Continuing |
| Test & Evaluation - APB 5 | WR | Operational Test Force : Norfolk VA | 9.270 | 0.545 | Jul 2016 | 0.900 | Jul 2017 | 2.000 | Jun 2018 | - | | 2.000 | Continuing | Continuing | Continuing |
| Modeling & Simulation | WR | NUWC NPT : Newport RI | 9.745 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Modeling & Simulation | C/CPFF | ARL / PSU : State College PA | 11.114 | 1.476 | Apr 2016 | 1.522 | Apr 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Test & Evaluation - APB 6 | C/CPFF | ARL/PSU : State College PA | 0.000 | 0.000 | | 0.000 | | 1.567 | Apr 2018 | - | | 1.567 | 0.000 | 1.567 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205632N / *MK-48 ADCAP* | Project (Number/Name)<br>0366 / *MK 48 ADCAP* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test & Evaluation - Spiral 4 / PY | WR | NUWC Keyport (KPT) : Keyport WA | 29.437 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 29.437 | - |
| Test & Evaluation - APB 5 | WR | NUWC Keyport (KPT) : Keyport WA | 7.157 | 10.190 | Oct 2015 | 6.818 | Oct 2016 | 6.670 | Oct 2017 | - | | 6.670 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 87.727 | 17.629 | | 12.423 | | 20.986 | | - | | 20.986 | - | - | - |

**Remarks**

Funds in-water run costs and personnel to support such events and modeling and simulation performance evaluation. FY 2018 increase for APB 5 in-water test events and APB 6 software testing.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management Support | C/CPFF | Alion Science : Mclean VA | 4.390 | 0.468 | Jan 2016 | 0.482 | Oct 2016 | 0.496 | Nov 2017 | - | | 0.496 | Continuing | Continuing | Continuing |
| Travel | WR | NAVSEA : Washington DC | 1.200 | 0.049 | Oct 2015 | 0.050 | Oct 2016 | 0.050 | Oct 2017 | - | | 0.050 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 5.590 | 0.517 | | 0.532 | | 0.546 | | - | | 0.546 | - | - | - |

**Remarks**

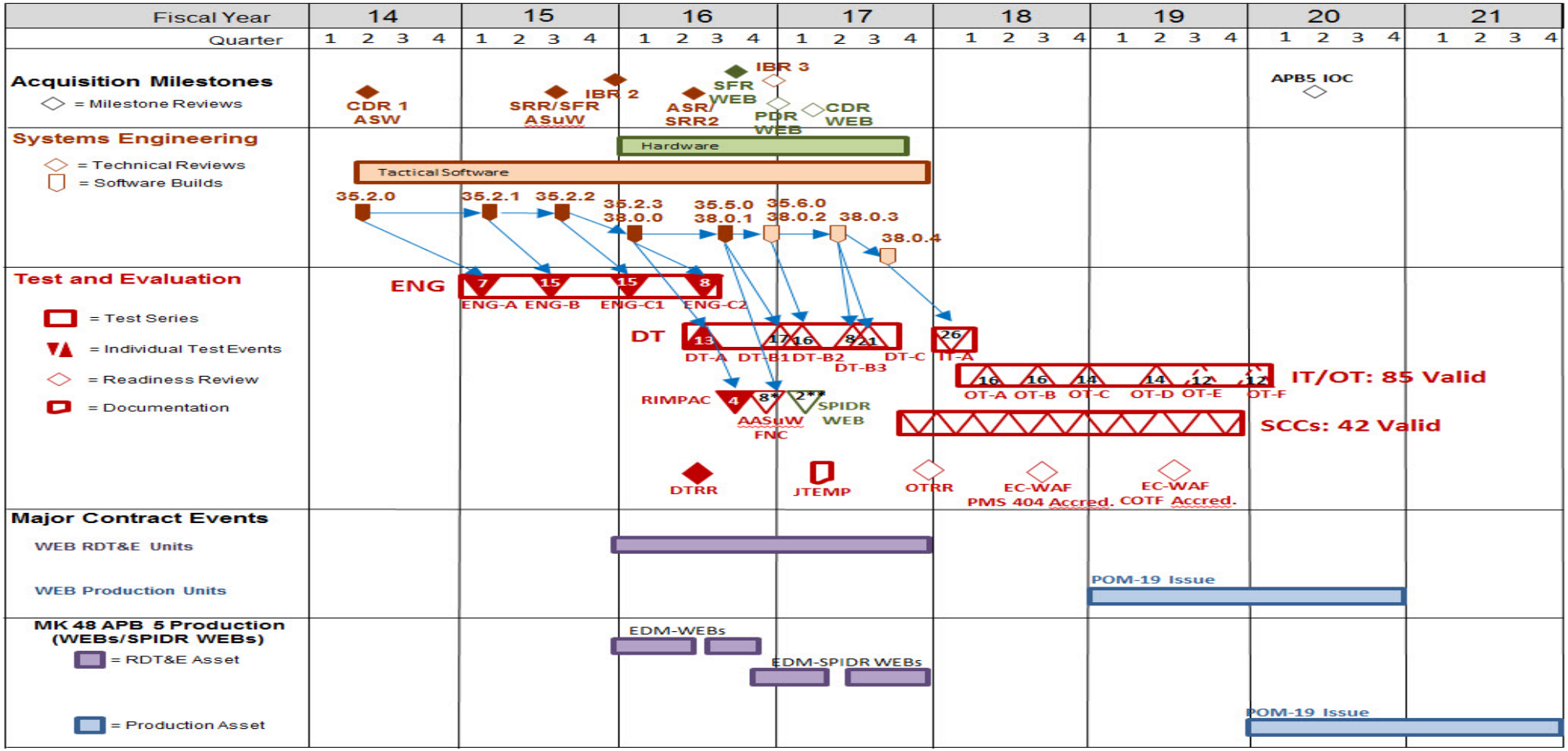
Funds program support, program travel, and OPTEVFOR travel.

| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 253.140 | 42.186 | | 39.134 | | 68.553 | | - | | 68.553 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>0366 / *MK 48 ADCAP* |

# MK 48 MOD 7 APB5 Acquisition Schedule



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>0366 / *MK 48 ADCAP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0366*** | | | | |
| APB 5 Development: APB 5 Developmental Test (DT) | 2 | 2016 | 4 | 2017 |
| APB 5 Development: APB 5 Operation Test (OT) | 1 | 2018 | 1 | 2020 |
| APB 5 Development: APB 5 IOC | 2 | 2020 | 2 | 2020 |
| APB 6 Software / TI-1 Hardware Development: APB 6 Development | 1 | 2016 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205632N / *MK-48 ADCAP* | Project (Number/Name)<br>9999 / *Congressional Adds* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9999: *Congressional Adds* | 0.000 | 5.310 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.310 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

MK48 Heavyweight Torpedo APB5+ enhancements are required to address CCS/MK48 pre and post launch interface issues which limit crew full implementation of the weapon and provide numerous capability enhancements requested and endorsed by the STRG. APB5+ modernizes the torpedo-to-CCS interface, improves Pk, increases platform safety, provides platform data decoupling the CCS/MK48 operational software interdependence, and would enable torpedo operational software (OPSW) updates while deployed through the CCS. APB5+ also corrects numerous HARs and provides new CCS/MK48 interface protocol (Ethernet over DDL.) Specific mods include the interlaced telemetry, iFENCE, TMA updates, ballistics in payload, new waypoints. Secondary affect will be to improve overall CCS/MK48 program alignment and/or efficiency.

APB5+ will provide increased platform safety and will enable future payload-to-platform capabilities providing for full utilization of platform data to the weapon (as well as data from the weapon to the platform) with the cumulative effect of increasing Pk. APB5+ addresses safety HARs and modernizes the torpedo to weapon interface to enable more effective communications.

APB5+ requires a corresponding Combat Control System modification to benefit from the improved capabilities.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2016 | FY 2017 |
|---|---|---|
| ***Congressional Add:*** Upgrade Program | 5.310 | 0.000 |
| ***FY 2016 Accomplishments:*** APB 5+ development efforts:<br>- Update Interface Design Specification<br>- Conduct Future Torpedo Studies<br>- Design Advanced Weapon Performance Models | | |
| ***FY 2017 Plans:*** N/A | | |
| **Congressional Adds Subtotals** | 5.310 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205632N / *MK-48 ADCAP* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |

**E. Performance Metrics**

Milestone review

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0205633N *I Aviation Improvements* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 1,235.307 | 103.685 | 120.861 | 119.099 | - | 119.099 | 122.717 | 120.587 | 119.417 | 121.806 | Continuing | Continuing |
| 0601: *Acft Handling & Service Equip* | 29.232 | 2.254 | 2.631 | 2.722 | - | 2.722 | 2.780 | 2.840 | 2.739 | 2.793 | Continuing | Continuing |
| 0852: *Consolidated Auto Support System* | 155.007 | 6.382 | 6.494 | 6.661 | - | 6.661 | 6.815 | 6.959 | 7.010 | 7.149 | Continuing | Continuing |
| 1041: *Acft Equip Repl/Maint Prog* | 46.599 | 3.400 | 3.245 | 3.356 | - | 3.356 | 3.383 | 3.502 | 3.587 | 3.657 | Continuing | Continuing |
| 1355: *Propulsion and Power Component Improvement Program* | 980.412 | 73.811 | 93.543 | 94.001 | - | 94.001 | 105.965 | 106.482 | 106.081 | 108.207 | Continuing | Continuing |
| 2269: *Expeditionary Airfield Improvements* | 24.057 | 17.838 | 14.948 | 12.359 | - | 12.359 | 3.774 | 0.804 | 0.000 | 0.000 | 0.000 | 73.780 |

**A. Mission Description and Budget Item Justification**

Project 0601 - Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft.

Project 0852 - Consolidated Automated Support System is a standardized Automated Test Equipment with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles.

Project 1041 - Aircraft Equipment Reliability/Maintainability Improvement Program is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost.

Project 1355 - Aircraft Engine Component Improvement Program develops reliability and maintainability and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, fuels, and lubricants.

Project 2269 - The Expeditionary Airfields (EAF) program designs, develops, tests and fields a sustainment lighting system to replace existing obsolete legacy EAF lighting system.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0205633N *I Aviation Improvements* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 106.255 | 120.861 | 134.664 | - | 134.664 |
| Current President's Budget | 103.685 | 120.861 | 119.099 | - | 119.099 |
| Total Adjustments | -2.570 | 0.000 | -15.565 | - | -15.565 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.318 | 0.000 | | | |
| • SBIR/STTR Transfer | -2.252 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -14.482 | - | -14.482 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -1.083 | - | -1.083 |

**Change Summary Explanation**

Cost: Not Applicable

Schedule:

Project 0601: Carrier Crash Crane Milestone B and Milestone C realigned and rescheduled due to requirement updates from F-35 incorporation in the Requirement Analysis Document and the removal of Assault Ship from the procurement. Milestone B shift from 1st quarter FY17 to 2nd quarter FY19 and Milestone C shift from 4th quarter FY19 to 1st quarter FY22.

Project 0852: eCASS milestone Full Rate Production Decision Review and contract award for Full Rate Production shift from 3rd Quarter FY 2016 to 1st Quarter FY 2017 in order to resolve deficiencies found during the test sprint periods. Resolving these deficiencies improves product effectiveness for Navy and Marine operators and will ensure repeatable manufacturing production. EO3 Technology Development was added as an FY18 planned project. This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems.

Project 2269: Sustainment Lighting System (SLS) production milestone for Full Rate Production Lot 1 moved from 2nd Quarter FY 2019 to 4th Quarter FY 2019. SLS Critical Design Review moved from 4nd Quarter FY 2016 to 2nd Quarter FY 2017.

Technical: Not Applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>0601 / *Acft Handling & Service Equip* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0601: *Acft Handling & Service Equip* | 29.232 | 2.254 | 2.631 | 2.722 | - | 2.722 | 2.780 | 2.840 | 2.739 | 2.793 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Common Ground Equipment is a Naval Aviation project to apply new technology to common support equipment necessary to support multiple systems/aircraft within the Navy. The common support equipment items developed with this budget are briefed to the Air Force, Army and Coast Guard for possible use in joint procurement in the production phase.

New programs are Turbo Shaft Engine Dynamometer Technology Development and Borescope Technology Development in FY18. Turbo Shaft Engine Dynamometer Technology Development involves efforts to develop a next generation ability to test the latest T700 engine's which will require higher torque levels than are currently available. Borescope Technology Development is to identify ways to increase availability and reliability of the current generation of borescopes that will become unsupportable as the manufacturer will stop support by FY22.

Funding supports the evaluation, testing and integration to develop Portable Electronic Maintenance Aids (PEMA) Commercial Off the Shelf solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistics Command/Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Turbo Shaft Engine Dynamometer Technology Development | 0.000 | 0.000 | 0.575 | 0.000 | 0.575 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop, integrate, and evolve dynamometer technologies and capabilities for insertion into testing of turbo shaft engines. Current V35 dynamometer used to test T700 engines at the intermediate maintenance level has obsolescence issues and worn components that have been overhauled three times since initial fielding in the 1980s. The OEM has stated that it does not recommend a fourth overhaul due to structural issues. Insertion of new dynamometer technologies is required to test next generation T700 engines with increased torque and horsepower and to retire legacy units which have tired metal due to cycle fatigue. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0601 / *Acft Handling & Service Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Perform market research of various dynamometer technologies needed to meet current and emergent T700 engine performance requirements. Evaluate dynamometer technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy dynamometer replacement.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Borescope Technology Development<br>***Articles:***<br>***Description:*** Develop, integrate, and evolve borescope technologies to meet emergent jet engine inspection requirements. Current fielded engine borescopes are unable to measure required defects on aircraft turbine engine compressor blades to the accuracy required. Additionally, current legacy borescopes will not be supported by the original equipment manufacturer beyond FY22. Legacy borescopes are susceptible to damage due to the insertion tube not being detachable/removable. A detachable insertion tube would increase system availability and reduce repair costs. New borescope technology is needed to improve defect measurement accuracy and equipment supportability.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Perform market research of various borescope technologies needed to meet current and emergent engine inspection requirements. Evaluate borescope technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy borescope replacement.<br>***FY 2018 OCO Plans:*** | 0.000<br>- | 0.000<br>- | 0.483<br>- | 0.000<br>- | 0.483<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0601 / *Acft Handling & Service Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Aircraft Spotting Dolly (ASD) | 0.739 | 0.300 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | 1 | 1 | - | - | - |
| ***Description:*** There are no commercially available towing vehicles that could even be modified to replace the capabilities of the present SD-2. An R & D effort will be required to design its replacement. Advances in batteries and alternating current motor drive systems in the past decade have made it feasible to design an electrically powered vehicle for the CV, CVN, and L-Class hanger deck spotting missions. Such a vehicle will be inherently more reliable, reduce maintenance, and eliminate the fumes and noise generated by a diesel engine. An electrically driven vehicle will provide much greater motion control for slow speeds to aid in the engagement to the aircraft nose gear. Proximity sensors will be incorporated to automatically stop the spotting dolly prior to accidental impact with the aircraft, other support equipment or bulkheads, increasing the safety of the spotting operations. The legacy ASD is close to thirty years old and experiencing parts obsolescence issues and general efficiency degradation.<br>***FY 2016 Accomplishments:***<br>Perform source selection, award prototype contract, and begin prototype phase.<br>***FY 2017 Plans:***<br>Perform government testing of prototype.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Carrier Crash Crane (CV) | 1.070 | 1.886 | 0.964 | 0.000 | 0.964 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Name change from Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) to Carrier Crash Crane (CV) due to crane no longer supporting amphibious assault ship. CV are required to remove damaged aircraft from the flight deck. In 2004, a solicitation for a commerical off the shelf replacement for the existing shipboard crash crane was issued. Two bids were received, and after a complete evaluation with many rounds of discussions with the companies bidding, both proposals were found to be technically inadequate and the procurement effort was discontinued. As a result, the crash cranes have continued operation unchanged. Designed in the late 1980's, major systems are beginning to experience the obsolescence of spare parts and are | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0601 / *Acft Handling & Service Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| in need of updating. R&D resources are needed to identify not only replacements, but new technologies, which can increase the reliability and maintainability of this flight ops critical piece of equipment. Systems updates would include the engine/generator and electrical updates to the motor drive/control system. An exploration of power sources other than diesel engines would be considered and a corrosion resistant boom.<br><br>***FY 2016 Accomplishments:***<br>Prepare source selection documentation, prepare test plan documents and initiate source selection.<br><br>***FY 2017 Plans:***<br>Continue source selection documentation, continue test plan documents and continue source selection.<br><br>***FY 2018 Base Plans:***<br>Prepare contract spec, RFP, SOW and prepare for source selection.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Portable Electronic Maintenance Aid (PEMA)<br>***Articles:***<br><br>***Description:*** Portable Electronic Maintenance Aid (PEMA) funding supports the evaluation, testing and integration to develop PEMA Commercial Off-the-Shelf (COTS) solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistic Command Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems.<br><br>***FY 2016 Accomplishments:***<br>Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the Global Information Grid (GIG) prior to deployment to the fleet by a yearly release cycle.<br><br>***FY 2017 Plans:*** | 0.445<br>- | 0.445<br>- | 0.700<br>- | 0.000<br>- | 0.700<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0601 / *Acft Handling & Service Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle.<br>***FY 2018 Base Plans:***<br>Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.254 | 2.631 | 2.722 | 0.000 | 2.722 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0705: *Ground Support Equipment - CSE/ICP* | 93.279 | 91.671 | 84.915 | - | 84.915 | 87.455 | 84.951 | 87.028 | 88.766 | Continuing | Continuing |
| • OPN/4268: *Aviation Support Equipment - PEMA* | 7.762 | 7.280 | 6.815 | 6.094 | 12.909 | 7.301 | 7.482 | 7.612 | 7.753 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Common Ground Equipment: This is a non ACAT program. Field activities propose tentative projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group process selects projects to transition to procurement.

Portable Electronic Maintenance Aids: The management approach includes the Program Management Office residing at NAVAIR with Milestone Decision Authority delegated to the Naval Air Systems Command Chief Information Officer. The evolutionary development approach will be used to execute requirements. Contracting for the prime integrator will be via competitively awarded Indefinite Delivery/Indefinite Quantity contracts.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>0852 / *Consolidated Auto Support System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0852: *Consolidated Auto Support System* | 155.007 | 6.382 | 6.494 | 6.661 | - | 6.661 | 6.815 | 6.959 | 7.010 | 7.149 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The electronic Consolidated Automated Support System (eCASS) project is the system design and development of the latest generation of the US Navy's CASS family of automatic test systems. The legacy CASS system was designed and developed in the 1980's and commenced fielding in 1992. As such, it is reaching the end of its useful life due to obsolescence issues. eCASS is the replacement system for legacy CASS systems, which provides Naval aircraft avionics component maintenance and repair support at Intermediate and Depot maintenance facilities both shore-based and afloat. As a CASS replacement program, the eCASS program objectives remain the same as that of CASS. Specifically: (1) increase material readiness; (2) reduce life cycle costs; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and emerging avionics/electronics aircraft weapon systems.

The Test Technology Development project involves analysis, application, maturation, integration and testing of emerging electronic, mechanical and optical test technologies for potential military utility in support of Naval avionics testing and repair. Specific technologies being developed include synthetic instruments, advanced electro-optics capabilities, high speed bus technologies, and modernization elements for the CASS family of automatic test systems.

The Third Generation Electro-Optical (EO3) Technology Development project consists of the design and development of technology solutions, including a near-infrared camera solution to replace the existing obsolete EO3 console camera, for use in 65 fielded Navy test systems at both shore-based and afloat sites. The EO3 console subsystem is hosted by the US Navy Consolidated Automated Support System (CASS/eCASS) family of automatic test systems and is used to test, diagnose and repair the H-60 Multi-spectral Targeting System (MTS) and F/A-18 Advanced Targeting Forward Looking Infrared (ATFLIR) weapon systems. The objective of the EO3 Technology Development project is to extend the useful life of fielded EO3 systems in order to sustain H-60 MTS and F/A-18 ATFLIR weapon system readiness until a next-generation EO replacement system can be designed, developed, produced, and fielded.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** eCASS Development | 5.303 | 3.722 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Develop, integrate and test an Automatic Test System (ATS) to replace legacy CASS systems. The new ATS will be compatible with and capable of hosting the hundreds of existing Test Programs that are currently utilized on legacy CASS at the Intermediate and Depot levels of maintenance, as well as any emerging Test Programs that may require greater test capability than provided by legacy CASS. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0852 / *Consolidated Auto Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Continue test events.<br>***FY 2017 Plans:***<br>Develop, integrate, prototype design changes to support Test Program Set (TPS) migration for existing eCASS TPS candidates. Emphasis will be to develop and evaluate potential solutions to support development of future Engineering Change Proposals (ECPs).<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test Technology Development<br>***Articles:***<br>***Description:*** Develops, integrates, and evolves enhanced test capabilities and technologies for insertion into the Consolidated Automated Support System (CASS) family of test systems. As weapon system electronics evolve, new test capabilities are required to support advanced systems. Existing test capabilities must be extended in range, accuracy, time and frequency domains in order to sustain the required test accuracy ratios for weapon systems support (the automatic test system must be four times as accurate as the asset being tested).<br>***FY 2016 Accomplishments:***<br>Develop, integrate, and evolve enhanced test capabilities and technologies for insertion into the CASS family of test systems. Perform market research into various near infrared camera technology, generate analysis of alternatives, and develop an acquisition strategy for the obsolete EO3 camera replacement technology solution. Conduct studies and develop alternatives for the replacement of the CASS EO3 console with a next generation solution.<br>***FY 2017 Plans:***<br>Design and develop two prototype near infrared camera assemblies. Evaluate prototype cameras assemblies against the camera source control drawings for compliance. Assess additional EO3 obsolescence issues that require resolution to sustain readiness until EO3 sundown. Conduct research and development of next generation EO alternatives.<br>***FY 2018 Base Plans:*** | 1.079<br>- | 2.772<br>- | 2.382<br>- | 0.000<br>- | 2.382<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0852 / *Consolidated Auto Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue to develop, integrate, and evolve enhanced test capabilities and technologies for insertion into the CASS family of test systems with an increased focus on development and evaluation of next generation EO solutions for the replacement of the CASS EO3 console.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** EO3 Technology Development | 0.000 | 0.000 | 4.279 | 0.000 | 4.279 |
| ***Articles:*** | - | - | 2 | - | 2 |
| ***Description:*** This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Integrate two prototype near infrared camera assemblies into the EO3 system. Perform EO3 system design verification testing against the system specification requirements for compliance. Research and analyze solutions for other EO3 obsolescence resolution requirements.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 6.382 | 6.494 | 6.661 | 0.000 | 6.661 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0705: *Common Ground Equipment-CASS/ATE* | 130.917 | 110.114 | 104.170 | - | 104.170 | 112.606 | 112.947 | 121.384 | 123.813 | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>0852 / *Consolidated Auto Support System* |

**D. Acquisition Strategy**

Formal test technology reviews with industry are conducted annually (cooperative Joint Services initiative) to define maturity of needed technologies. Further studies are conducted as needed. Procurement strategy is determined by market survey and cooperative opportunities.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>1041 / *Acft Equip Repl/Maint Prog* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1041: *Acft Equip Repl/Maint Prog* | 46.599 | 3.400 | 3.245 | 3.356 | - | 3.356 | 3.383 | 3.502 | 3.587 | 3.657 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) is the only Navy program which provides Research, Development, Test & Evaluation engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through reliability, maintainability, and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high-priority flight testing which is not associated with any acquisition or development program under the Flight Test General task.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Avionics and Wiring | 0.325 | 0.564 | 0.379 | 0.000 | 0.379 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Continue pursuit of technology advances in ultra-high density power storage from industry. Address avionics related reliability/ maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation. Continue to review and investigate high speed data connector reliability in aircraft subsystems. | | | | | |
| ***FY 2017 Plans:***<br>Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1041 / *Acft Equip Repl/Maint Prog* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Air Vehicle | 2.060 | 2.071 | 2.060 | 0.000 | 2.060 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Provide human factors focus to improve maintainability through enhanced maintainer performance. Begin development of sensor fusion for advanced prognostics with focus on low cost and reduced labor procedures that can be done in fleet environments. Continue to qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of cold spray component repair.<br>***FY 2017 Plans:***<br>Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.<br>***FY 2018 Base Plans:***<br>Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Systems Engineering Revitalization | 1.015 | 0.610 | 0.917 | 0.000 | 0.917 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1041 / *Acft Equip Repl/Maint Prog* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>First, continue improvements in the System Engineering (SE) Technical Review process through model-centric analysis and design techniques in an attempt to shorten acquisition timelines and "Speed to the Fleet" at the system program of record level. Second, correct any deficiencies in the conversion to web-based checklist tool, implement tool in Secret Internet Protocol Router Network, and execute future upgrades. Third, update checklist questions to account for ever changing policy direction and streamline across the acquisition lifecycle to focus the review on its core elements.<br>***FY 2017 Plans:***<br>First, continue improvements in the Systems Engineering (SE) Technical Review (SETR) process by implementing model-centric SE policies, methods, and tools. Second, continue SETR checklist content improvements and improve SETR Manager tool to assist in dissemination of SE policy, SE tools, checklists, and associated training. Third, develop and improve an SE requirements tool and the integrated SE environment.<br>***FY 2018 Base Plans:***<br>Continue with improvements in the current SE process and transition to model-centric systems engineering methodology (SE transformation). This transformation evolution requires updates to process, methods, tools, and training. Associated products include evolving SETR checklist to a model-centric design assessment framework and continuing the development and deployment of the web-based collaborative SE toolset (Integrated System Engineering Environment).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.400 | 3.245 | 3.356 | 0.000 | 3.356 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1041 / *Acft Equip Repl/Maint Prog* |

**E. Performance Metrics**

The Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) program will, at a minimum, fund 8 to 15 projects a year that investigate and evaluate reliability and maintainability improvements to in-service, out-of-production aircraft equipment. AERMIP projects will have a greater than 75% success rate of insertion into Department of the Navy warfighting systems or support infrastructure.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>1355 / *Propulsion and Power Component Improvement Program* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1355: *Propulsion and Power Component Improvement Program* | 980.412 | 73.811 | 93.543 | 94.001 | - | 94.001 | 105.965 | 106.482 | 106.081 | 108.207 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Propulsion and Power (P&P) Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy and Marine Corps aircraft propulsion systems. The highest priority issues P&P CIP addresses concern safety-of-flight deficiencies, which account for approximately 80% of P&P CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness and Reliability and Maintainability, and reduces platform Life Cycle Cost. Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term strategies. P&P CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion and power systems as an integral part of Reliability Centered Maintenance initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during OPERATIONS DESERT SHIELD/DESERT STORM, ENDURING FREEDOM, and IRAQI FREEDOM due to sand erosion. In addition, new problems arise through actual fleet deployment and usage of the aircraft. System development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those that the aircraft was designed to perform. Therefore, it has been found that P&P CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. P&P CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. P&P CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, aircraft wiring, and fuel and lubricant systems. These efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. P&P CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** P3, E2, C2, C130 (T56) | 7.051 | 9.423 | 11.000 | 0.000 | 11.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Complete prop shaft repair qualification effort and release repair to depot. Complete turbine clearance effort and release new limits to depot. Begin effort to evaluate pull-criteria and standardize engine performance | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| measurement to ensure consistent, reliable, and accurate results are achieved by operators. Complete incorporation of scavenge filter assemblies and Y-fittings to alleviate oil loss caused by high scavenge back pressure. Complete engine qualification testing and submit engineering changes for production 3-4 turbine spacer, propeller brake redesign, planet gear bearing assembly, front turbine bearing cage, and front turbine bearing support redesigns. Complete reduction gearbox qualification testing for propeller brake redesign to improve reliability.<br>***FY 2017 Plans:***<br>Complete engine qualification testing for planet gear bearing assembly. Initiate qualification testing for combustion liner, front turbine bearing cage, and front turbine bearing support redesigns. Submit engineering change for production planet gear bearing assembly.<br>***FY 2018 Base Plans:***<br>Complete bench testing and qualification testing on front turbine bearing cage, front turbine bearing support and combustor liner redesigns. Execute engine Accelerated Mission Test. Submit engineering change for combustor liner redesign. Initiate development and design of updated software for the propulsion control and monitoring unit to correct identified deficiencies.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** E2/C2/C130/P3 (Props) | 2.000 | 2.130 | 1.500 | 0.000 | 1.500 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Complete fleet incorporation of the NP2000 feather modification to eliminate a failure mode that caused an E-2C mishap. Begin fleet introduction of the NP2000 modernized pump housing and the actuator valve module with new transfer tube configuration. Begin field service evaluation of NP2000 blade erosion protection film. Continue fleet incorporation of NP2000 front spinner with repairable mounting hole. Begin field service evaluation of a new propeller anti/de-icing brush block for the C-130 and P-3 propeller.<br>***FY 2017 Plans:***<br>Complete fleet incorporation of the NP2000 feather modification to eliminate a safety issue. Begin field service evaluation of NP2000 blade erosion protection film. Begin fleet introduction of the NP2000 modernized pump housing and the actuator valve module with new forward housing configuration. Begin fleet incorporation of NP2000 front spinner with repairable mounting hole. Begin field service evaluation of a new propeller anti/de- | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| icing brush block for the C-130 and P-3 propeller. Continue design work and begin testing of C-130 54H60-111 modernized pump housing.<br>***FY 2018 Base Plans:***<br>Complete design and submit engineering change for 54H60 propeller brake lining obsolescence redesign. Complete field service evaluation and submit engineering change for NP2000 variable pitch actuator transfer tube seal improvement redesign.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** EA-6B (J52) | 0.693 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Implement and continue updating repair and inspection criteria for fielded components. Manage parts obsolescence issues.<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SH-60B/F, HH-60H, MH-60R/S (T700) | 3.333 | 4.314 | 5.678 | 0.000 | 5.678 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Complete T700 accelerated simulated mission endurance testing to demonstrate newly redesigned ceramic matrix composite shrouds and cutback diffuser. Continue lithium battery qualification. Complete air turbine starter qualification.<br>***FY 2017 Plans:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Conduct T700 accelerated simulated mission endurance testing to demonstrate newly redesigned ceramic matrix composite | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| shrouds. Continue lithium battery qualification. Continue development of Black Gold environmental coating system.<br>***FY 2018 Base Plans:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Conduct lithium battery<br>qualification safety and performance testing. Complete test planning in preparation for an engine accelerated simulated mission endurance test and saltwater ingestion test to qualify Black Gold compressor coating.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** H-1 (T400/T700) | 0.700 | 1.000 | 0.431 | 0.000 | 0.431 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continue support of common T700 engine and air turbine starter projects. Complete project to address obsolescence for non-volatile random access memory chip in T700-401C Digital Engine Control Unit.<br>***FY 2017 Plans:***<br>Continue support of common T700 engine and air turbine starter projects. Conduct AH-1W starter improvement project. Complete main rotor gearbox oil filter relocation project.<br>***FY 2018 Base Plans:***<br>Redesign the air vehicle tail rotor flexible coupling to a non-lubricated design to improve reliability. Update subsystem support planning based on evaluation of maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AV-8B (F402) | 5.483 | 6.163 | 3.849 | 0.000 | 3.849 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete tasking for application of low plasticity burnishing on low pressure compressor stage two and three blades. Redesign #4 bearing insulating blanket. Update engine performance deterioration study. Assess mission profile analysis for life management plan update.<br>***FY 2017 Plans:***<br>Continue engine performance monitoring program. Complete low pressure turbine vane platform cracking, exhaust duct manifold cracking, and combustion chamber inner subassembly cracking tasks. Update critical rotating part life predictions based upon updated mission profiles.<br>***FY 2018 Base Plans:***<br>Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints. Continue efforts to identify alternate parts and vendors for consumable hardware.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** H-53/H-46/H-3 (T58/T64) | 4.437 | 5.884 | 4.530 | 0.000 | 4.530 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>H-46/H-3 (T58)<br>Continue to develop inspection and repair criteria for fielded components.<br>H-53 (T64)<br>Continue life management analysis and reliability centered maintenance efforts. Continue to develop inspection and repair criteria for fielded components. Continue cost of ownership reduction programs. Qualify and implement accessory gearbox free-wheel unit lubrication design improvement. Complete main rotor shaft low-cycle fatigue analysis.<br>***FY 2017 Plans:***<br>H-46/H-3 (T58)<br>Continue to develop inspection and repair criteria for fielded components.<br>H-53 (T64)<br>Continue life management analysis and reliability centered maintenance efforts. Continue to develop inspection and repair criteria for fielded components. Continue cost of ownership reduction programs. Qualify and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| implement accessory gearbox free-wheel unit lubrication design improvement. Complete main rotor shaft low-cycle fatigue analysis.<br>***FY 2018 Base Plans:***<br>Continue to develop inspection and repair criteria for fielded components and optimization of depot-level engine build practices and procedures to increase engine performance. Continue updates of engine mission usage and engine critical hardware life management plans. Evaluate engine fuel nozzle candidate anti-coking coatings to improve fuel nozzle durability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** F-18 C/D/E/F (F414/F404)<br>***Articles:*** | 15.414<br>- | 14.958<br>- | 16.926<br>- | 0.000<br>- | 16.926<br>- |
| ***FY 2016 Accomplishments:***<br>Complete U.S. Navy F404 mission analysis and assess changes to part lives. Complete engine pressure ratio measurement accuracy improvement and develop an implementation strategy. Reduce non-recoverable in-flight shutdown by identifying key contributors and addressing the top five reasons. Reduce in-flight aborts by identifying key contributors and addressing the top five reasons. Monitor test cell performance reports from fleet and assess changes required. Finalize design for removing life limit main fuel manifold, complete outer bypass duct (OBD) delamination preliminary design, and complete and implement OBD improved anchor nut durability. Complete preliminary design and down-select candidate to improve N2 shroud durability, complete preliminary design, down-select candidate to eliminate Variable Exhaust Nozzle (VEN) actuator wear/binding, and test and verify full-authority digital electronic control 4NH software changes to reduce stalls. Redesign VEN boost pump rear cover to eliminate a life limit, improve fuel tube Rosan joint fittings to eliminate external fuel leaks, and identify oil system improvements to reduce unscheduled removals.<br>***FY 2017 Plans:***<br>Update stress analysis models to extend the lives of the combustion case, low-pressure turbine (LPT) disk, and stage 1 fan rotor. Complete preliminary design and start detail design to down-select the field repair for fan case rubber damage. Test and verify that the main fuel manifold is no longer life-limited. Complete high-pressure turbine blade preliminary design, and down-select a design to address service distress causes for removal. Complete LPT shrouds preliminary design, and down-select a design to allow for field replacement. Complete test and verification of Rosan joint fittings and release to the fleet. Complete preliminary design, and down-select the fuel actuator engineering test bench design. Conduct tests to characterize influences and interactions, and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| confirm causes for VEN binding. Test and verify that blade dovetail coatings meet service use requirements. Evaluate oil consumption limits, and down-select designs to oil system components that reduce in-flight aborts. Explore the use of surface treatments on static components to allow for extended service use. Reassess the engine build window to identify ownership costs reductions.<br>***FY 2018 Base Plans:***<br>Continue F404 engine electrical control assembly obsolescence redesign. Develop an improved engine vibration measurement system to increase measurement accuracy at fleet test cells. Continue evaluation and testing of alternate engine fan blade dovetail coatings to improve component durability. Perform rotor spin testing of engine fan hardware to verify the low cycle fatigue life benefit of the low plasticity burnishing surface treatment. Apply data analytics tools to engine reliability data sets to identify engine removal driver causes. Complete design efforts to extend the life of the F414 engine main fuel manifold. Continue redesign of the high-pressure turbine blades to reduce the frequency of unscheduled engine removals. Continue design of improved oil system components and architecture to reduce in-flight mission abort rates. Continue investigation of engine variable exhaust nozzle hydro-mechanical failure events. Continue analysis and evaluation of composite outer bypass duct delamination.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** T-45 (F405)<br>***Articles:*** | 2.321<br>- | 4.723<br>- | 3.021<br>- | 0.000<br>- | 3.021<br>- |
| ***FY 2016 Accomplishments:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies and address safety issues reported from fleet. Complete high pressure compressor seal redesign to improve performance retention, and reduce scrap rate at overhaul. Complete high and low pressure turbine seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Initiate high pressure turbine redesign to reduce scrap rate at overhaul. Initiate comparison of flight profiles and engine duty cycles between T-45 operating sites to evaluate differences in engine rejection causes and parts usage.<br>***FY 2017 Plans:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies, and address safety issues reported from fleet. Complete component endurance testing of low-pressure compressor blade improvements to mitigate blade root cracking in-service and reduce scrap rate at overhaul. Complete redesign of engine correct rotation system to reduce high failure rate and reduce cost | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| of ownership. Complete high-pressure turbine and low-pressure turbine seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Complete high-pressure compressor seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Initiate root cause investigation of perceived installed engine vibrations to reduce high rejection rate and cost of ownership. Initiate study to identify engine future obsolescence areas. Complete effort to extend fatigue life of high-pressure turbine and low-pressure turbine discs using new material data to reduce cost of ownership.<br>***FY 2018 Base Plans:***<br>Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed<br>deficiencies and address safety issues reported from fleet. Initiate component level rotor spin testing of the low pressure compressor to verify the ability of the improved blade dovetail coating system to mitigate blade cracking under high-cycle fatigue excitation conditions. Perform assessment of engine cyclic usage rates at the Kingsville and Meridian sites to update critical rotating engine part lives. Continue study to identify mitigation approaches to address propulsion and power system component obsolescence issues.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** V-22 Propulsion | 2.893 | 3.392 | 4.236 | 0.000 | 4.236 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Implement nacelle blower and machined impellers design changes. Validate engine control hardware-in-the-loop (HWIL) simulation with updated engine control software and transition to "Software" full authority digital engine control to reduce future costs of maintaining the HWIL capability. Continue development of monitoring algorithms and addition of high frequency vibration monitoring to drive system gearboxes for trend monitoring. Continue prop rotor gearbox design improvements to reduce disengagement events. Improve engine air particle separator scavenge flow to decrease sand ingestion into the engine for additional engine reliability. Produce and conduct verification testing for several potential design solutions that are intended to mitigate sand accumulation in the turbine.<br>***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Develop improvements for the K8/K9 relays to reduce K8/K9, regulator converter unit, and auxiliary power unit starter failures. Develop an improved power assurance check for the engines to ensure accurate assessment of engine health.<br>***FY 2018 Base Plans:***<br>Prepare for full-scale engine testing to mitigate rapid power loss and engine surge events that have occurred during reduced visibility landing operations to increase flight safety. Complete update of engine critical part lives and engine life management plan based on updated mission mix usage requirements. Perform redesign to improve prop rotor input quill clutch system robustness to address known failure modes. Continue efforts to improve accuracy of the in-flight power assurance check to improve mission planning capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Adversary (J85) (F100) | 1.023 | 1.434 | 2.660 | 0.000 | 2.660 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continue contributing to the J85 and F100 common Component Improvement Program (CIP) with the U.S. Air Force (USAF) and Foreign Military Sales group. Perform validation and life assessment of life cycle fatigue components, including hardware inspection data, mission mix analysis, advanced fracture mechanics, and stress models to provide a revised J85 life cycle fatigue life update. Investigate and approve a turbine nozzle activated diffusion healing repair procedure, and support equipment upgrades and other repair procedures. Approve F100 main fuel control seal durability improvement, first blade/second stage vane durability improvement, and combustion chamber stiffener improvement. Analyze CIP benefits, updated mission, and components life extension.<br>***FY 2017 Plans:***<br>Continue contributing to the J85 and F100 common CIP with the USAF and Foreign Military Sales group. Perform validation and life assessment of life cycle fatigue components, including hardware inspection data and stress models to provide a revised J85 life cycle fatigue life update. Implement an upgraded modification of the engine performance monitoring system for future mission analysis. Investigate and approve a stage 2 turbine nozzle design that mitigates cracking due to oxidation. Develop support equipment and engine repair procedures that will improve maintainability and extend the useful life of parts. Approve F100 main fuel control | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| seal durability improvement, first blade/second stage vane durability improvement, and combustion chamber stiffener improvement. Analyze CIP benefits, updated mission, and components life extension.<br>***FY 2018 Base Plans:***<br>Continue contributing to the J85 and F100 common CIP with the USAF and Foreign Military Sales customers. Continue validation and life assessment of J85 life limited critical rotating hardware in the compressor including front and rear spools and turbine including stage 1 and stage 2 disks. Evaluate hardware inspection data, and perform stress modeling to update low cycle fatigue life limits. Implement an upgraded modification of the engine performance monitoring system for future mission analysis. Implement J85 improved turbine thermocouple probe and harness redesign to reduce engine performance related removals driven by harness failures.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Joint Strike Fighter (F135 Engine)<br>***Articles:*** | 21.980<br>- | 30.479<br>- | 32.861<br>- | 0.000<br>- | 32.861<br>- |
| ***FY 2016 Accomplishments:***<br>Continue to work with Joint Program Office and U.S. Air Force (USAF) to prioritize and develop engineering project descriptions that resolve Fleet revealed deficiencies that are not part of system development. In concert with the USAF, support Joint service Lead-the-Fleet (LTF) engine testing on the conventional takeoff and landing/aircraft carriers system. Continue the procurement of the short takeoff/vertical landing hardware to initiate LTF testing.<br>***FY 2017 Plans:***<br>Continue to work with Joint Program Office and USAF to prioritize and develop engineering project descriptions that resolve Fleet revealed deficiencies that are not part of system development. In concert with the USAF, support Joint service LTF engine testing on the conventional takeoff and landing/aircraft carriers system. Continue the procurement of the short takeoff/vertical landing hardware to initiate LTF testing.<br>***FY 2018 Base Plans:***<br>Continue to work with Joint Program Office, USAF, international partners, and foreign military sales customers to prioritize and develop engineering project descriptions that resolve flight test and fleet service revealed deficiencies. In concert with the USAF, support joint service engine accelerated simulated mission endurance testing and LTF engine testing on the conventional takeoff and landing propulsion system. Prepare for the | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| short takeoff/vertical landing accelerated simulated mission endurance testing with hardware improvements to demonstrate continued durability improvement.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** P-8A (CFM56 Engine) | 1.150 | 1.150 | 0.500 | 0.000 | 0.500 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Develop out-year program engine management planning and operational/readiness metric baselines. Develop engine operational usage mission spectrum for use in original equipment manufacturer (OEM) engine life-limited component updates. Perform maturation of engine management planning activities with inputs from age exploration tasks: field service bore-scoping of high-time engines, engine component part condition assessments on first engine depot inductions and continued review of operational usage data. Evaluate leading indicators, service-revealed deficiencies, and emergent issues from fleet operational usage on all subsystems (engine, auxiliary power unit, fuel, electrical, electrical wiring). Evaluate OEM partial cycle analysis for use with engine life limited parts. | | | | | |
| ***FY 2017 Plans:***<br>Mature out-year program engine management planning and updates to operational/readiness metric baselines informed by further age-exploration results from post-deployment bore-scope inspections, engine depot part condition assessment, and operational usage data. Continue age exploration via post-deployment bore-scope inspections, engine depot part condition assessment, and operational usage data. Evaluate impact of high altitude antisubmarine warfare introduced under P-8A Increment 2 engineering change proposals on engine mission usage. Mature subsystem planning based on evaluation leading indicators, age exploration, maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet operational usage on all subsystems (engine, auxiliary power unit, fuel, electrical, electrical wiring). Evaluate incremental progress of original equipment manufacturer life limit extension analysis on engine life limited parts. | | | | | |
| ***FY 2018 Base Plans:***<br>Mature out-year program engine management planning and updates to operational and readiness metric baselines and mature subsystem support planning based on evaluation of leading indicators, age exploration results, maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Multi-Platform Product Support Teams | 5.333 | 8.493 | 6.809 | 0.000 | 6.809 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Study data system solutions for the Naval Power Avionics Thermal and Hydraulics Lab and install full control system solution. Provide support for growing modeling capability with large storage solutions for the research, development, test, and evaluation connected devices.<br>***FY 2017 Plans:***<br>Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Study data system solutions for the Naval Power Avionics Thermal and Hydraulics Lab and install full control system solution. Provide support for growing modeling capability with large storage solutions for the research, development, test, and evaluation connected devices.<br>***FY 2018 Base Plans:***<br>Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 73.811 | 93.543 | 94.001 | 0.000 | 94.001 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is a NON-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

**E. Performance Metrics**

The Propulsion and Power Component (P&P) Improvement Program (CIP) will support engineering design and development efforts for 100% of the safety of flight issues on in-service propulsion and power systems covered under the program. Over the past two years, this equated to more than 275 individual Engineering Project Descriptions (EPDs). P&P CIP will also address reliability and maintainability deficiencies equating to at least another 100 individual EPDs. Similar projects have increased the aggregate engine reliability across the USN/USMC fleet, as measured by the mean flight hours between engine removals, by 40% over the past eight years.

Program execution will be actively managed on 100% of the projects via contractor earned value data and overall obligation and expenditure rates as reflected in Navy ERP. Data will be analyzed and measured against OSD/FMB benchmarks on a monthly basis.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sys Eng T56 Engine Program | WR | NAWCAD : Patuxent River, MD | 34.967 | 3.500 | Nov 2015 | 4.500 | Nov 2016 | 4.153 | Nov 2017 | - | | 4.153 | Continuing | Continuing | Continuing |
| Sys Eng T56 Engine Program | SS/CPFF | Rolls Royce : Indianapolis, IN | 49.671 | 2.821 | Feb 2016 | 4.113 | Jan 2017 | 5.973 | Jan 2018 | - | | 5.973 | 0.000 | 62.578 | 63.045 |
| Sys Eng T56 Engine Program | WR | FRC-E : Cherry Point, NC | 1.698 | 0.692 | Nov 2015 | 0.750 | Nov 2016 | 0.810 | Nov 2017 | - | | 0.810 | Continuing | Continuing | Continuing |
| Sys Eng T56 Engine Program | WR | FRC-SE : Jacksonville, FL | 0.837 | 0.038 | Nov 2015 | 0.010 | Nov 2016 | 0.011 | Nov 2017 | - | | 0.011 | Continuing | Continuing | Continuing |
| Sys Eng T56 Engine Program | WR | FRC-SW : North Island, CA | 0.075 | 0.000 | | 0.050 | Nov 2016 | 0.053 | Nov 2017 | - | | 0.053 | Continuing | Continuing | Continuing |
| Sys Eng Props Program | SS/CPFF | Hamilton Sundstrand : Windsor Locks, CT | 24.035 | 2.000 | May 2016 | 2.130 | Jan 2017 | 1.500 | Jan 2018 | - | | 1.500 | 0.000 | 29.665 | 30.395 |
| Sys Eng J52 Engine Program | WR | NAWCAD : Patuxent River, MD | 14.129 | 0.300 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Sys Eng J52 Engine Program | SS/CPFF | UTC Pratt & Whitney : East Hartford, CT | 41.205 | 0.240 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 41.445 | 41.445 |
| Sys Eng J52 Engine Program | WR | FRC-E : Cherry Point, NC | 0.085 | 0.003 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Sys Eng J52 Engine Program | WR | FRC-SE : Jacksonville, FL | 0.275 | 0.150 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Sys Eng T700 Engine Program | WR | NAWCAD : Patuxent River, MD | 14.741 | 1.500 | Nov 2015 | 1.500 | Nov 2016 | 2.186 | Nov 2017 | - | | 2.186 | Continuing | Continuing | Continuing |
| Sys Eng T700 Engine Program | SS/CPFF | General Electric : Lynn, MA | 30.528 | 1.683 | Dec 2015 | 2.814 | Jan 2017 | 3.492 | Jan 2018 | - | | 3.492 | 0.000 | 38.517 | 38.517 |
| Sys Eng T700 Engine Program | IA | Army Research Lab : Aberdeen Proving Ground, MD | 0.000 | 0.150 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.150 | - |
| Sys Eng T400 Engine Program | WR | NAWCAD : Patuxent River, MD | 1.467 | 0.700 | Nov 2015 | 1.000 | Nov 2016 | 0.431 | Nov 2017 | - | | 0.431 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sys Eng T400 Engine Program | SS/CPFF | UTC Pratt & Whitney : East Hartford, CT | 5.890 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.890 | 5.890 |
| Sys Eng F402 Engine Program | WR | NAWCAD : Patuxent River, MD | 17.687 | 1.750 | Nov 2015 | 1.677 | Nov 2016 | 1.693 | Nov 2017 | - | | 1.693 | Continuing | Continuing | Continuing |
| Sys Eng F402 Engine Program | WR | NAWCWD : China Lake, CA | 0.000 | 0.303 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.303 | - |
| Sys Eng F402 Engine Program | WR | FRC-E : Cherry Point, NC | 0.642 | 0.255 | Nov 2015 | 0.050 | Nov 2016 | 0.105 | Nov 2017 | - | | 0.105 | Continuing | Continuing | Continuing |
| Sys Eng F402 Engine Program | MIPR | DTIC : Fort Belvoir, VA | 0.000 | 0.028 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.028 | - |
| Sys Eng F402 Engine Program | SS/CPFF | Rolls Royce : Bristol, England, UK | 73.229 | 2.302 | Feb 2016 | 4.436 | Jan 2017 | 2.051 | Jan 2018 | - | | 2.051 | 0.000 | 82.018 | 83.425 |
| Sys Eng F402 Engine Program | C/FFP | Hood Technology Corp : Hood River, OR | 0.000 | 0.845 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.845 | 0.845 |
| Sys Eng T58/T64 Engine Program | WR | NAWCAD : Patuxent River, MD | 33.079 | 1.750 | Dec 2015 | 2.150 | Nov 2016 | 2.501 | Nov 2017 | - | | 2.501 | Continuing | Continuing | Continuing |
| Sys Eng T58/T64 Engine Program | SS/CPFF | General Electric : Lynn, MA | 84.108 | 2.538 | Jan 2016 | 3.734 | Jan 2017 | 2.029 | Jan 2018 | - | | 2.029 | 0.000 | 92.409 | 92.409 |
| Sys Eng T58/T64 Engine Program | C/FFP | Danobat Machine Tool Co. : Humble, TX | 0.000 | 0.149 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.149 | 0.149 |
| Sys Eng F414/F404 Engine Program | WR | NAWCAD : Patuxent River, MD | 36.675 | 5.500 | Nov 2015 | 5.500 | Nov 2016 | 6.009 | Nov 2017 | - | | 6.009 | Continuing | Continuing | Continuing |
| Sys Eng F414/F404 Engine Program | SS/CPFF | General Electric : Lynn, MA | 139.806 | 9.862 | Dec 2015 | 9.208 | Jan 2017 | 10.649 | Jan 2018 | - | | 10.649 | 0.000 | 169.525 | 169.525 |
| Sys Eng F414/F404 Engine Program | WR | FRC-SE : Jacksonville, FL | 0.533 | 0.052 | Feb 2016 | 0.250 | Nov 2016 | 0.268 | Nov 2017 | - | | 0.268 | Continuing | Continuing | Continuing |
| Sys Eng F405 Engine Program | WR | NAWCAD : Patuxent River, MD | 9.337 | 1.250 | Nov 2015 | 3.208 | Nov 2016 | 1.448 | Nov 2017 | - | | 1.448 | Continuing | Continuing | Continuing |
| Sys Eng F405 Engine Program | SS/CPFF | Rolls Royce : Bristol, England, UK | 33.617 | 1.071 | Apr 2016 | 1.515 | Jan 2017 | 1.573 | Jan 2018 | - | | 1.573 | 0.000 | 37.776 | 39.237 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sys Eng V-22 Propulsion Program | WR | NAWCAD : Patuxent River, MD | 0.135 | 0.650 | Nov 2015 | 0.892 | Nov 2016 | 0.961 | Nov 2017 | - | | 0.961 | Continuing | Continuing | Continuing |
| Sys Eng V-22 Propulsion Program | SS/FFP | Bell- Boeing : Ft. Worth, TX | 6.779 | 0.100 | Aug 2016 | 2.000 | Jan 2017 | 1.775 | Jan 2018 | - | | 1.775 | 0.000 | 10.654 | 11.029 |
| Sys Eng V-22 Propulsion Program | SS/CPFF | Rolls Royce : Indianapolis, IN | 0.080 | 1.500 | Jul 2016 | 0.500 | Jan 2017 | 2.000 | Jan 2018 | - | | 2.000 | 0.000 | 4.080 | 4.590 |
| Sys Eng V-22 Propulsion Program | C/FFP | Nat'l Center for Manuf'g Sciences : Ann Arbor, MI | 0.000 | 0.166 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.166 | 0.166 |
| Sys Eng V-22 Propulsion Program | C/FFP | Univ of Dayton Research Inst. : Dayton, OH | 0.000 | 0.040 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.040 | 0.040 |
| Sys Eng V-22 Propulsion Program | MIPR | Army Research Lab : Aberdeen Proving Ground, MD | 0.000 | 0.299 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.299 | - |
| Sys Eng V-22 Propulsion Program | C/CPFF | UTC Pratt & Whitney : East Hartford, CT | 0.000 | 0.138 | Aug 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.138 | 0.138 |
| Sys Eng Adversary J85 Engine Program | WR | FRC-SE : Jacksonville, FL | 0.038 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Sys Eng Adversary J85 Engine Program | WR | NAWCAD : Patuxent River, MD | 1.936 | 0.660 | Nov 2015 | 1.034 | Nov 2016 | 1.430 | Nov 2017 | - | | 1.430 | Continuing | Continuing | Continuing |
| Sys Eng Adversary J85 Engine Program | SS/CPFF | General Electric : Lynn, MA | 1.772 | 0.280 | Apr 2016 | 0.400 | Jan 2017 | 1.230 | Jan 2018 | - | | 1.230 | 0.000 | 3.682 | 3.682 |
| Sys Eng Adversary J85 Engine Program | C/FFP | UTC Military Engines : East Hartford, CT | 0.000 | 0.083 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.083 | 0.083 |
| Sys Eng JSF Engine Program | WR | NAWCAD : Patuxent River, MD | 5.000 | 0.977 | Nov 2015 | 1.000 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | Continuing | Continuing | Continuing |
| Sys Eng JSF Engine Program | SS/FFP | UTC Pratt & Whitney : East Hartford, CT | 0.000 | 21.000 | Aug 2016 | 29.479 | Jan 2017 | 31.660 | Jan 2018 | - | | 31.660 | 0.000 | 82.139 | 82.139 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sys Eng JSF Engine Program | WR | FRC-E : Cherry Point, NC | 0.000 | 0.003 | Dec 2015 | 0.000 | | 0.201 | Nov 2017 | - | | 0.201 | 0.000 | 0.204 | - |
| Sys Eng P-8A Engine Program | WR | NAWCAD : Patuxent River, MD | 0.000 | 1.150 | Nov 2015 | 1.150 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Sys Eng Lab Fld Activity-1.0 or more | WR | NAWCAD : Patuxent River, MD | 204.512 | 4.578 | Nov 2015 | 7.695 | Nov 2016 | 6.448 | Nov 2017 | - | | 6.448 | Continuing | Continuing | Continuing |
| Sys Eng Other In-House Spt | Various | Various : Various | 20.417 | 0.000 | | 0.200 | Nov 2016 | 0.210 | Nov 2017 | - | | 0.210 | Continuing | Continuing | Continuing |
| GFE* | Reqn | DES/DLA : Various | 13.742 | 0.000 | | 0.200 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Prior Year Prod Dev costs no longer funded in the FYDP | Various | Various : Various | 62.882 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 62.882 | - |
| | | **Subtotal** | 965.609 | 73.056 | | 93.145 | | 93.850 | | - | | 93.850 | - | - | - |

**Remarks**

GFE includes expected cost of fuel necessary to support engine development and qualification testing.
Total may be off due to rounding.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | Various | Various : Various | 8.000 | 0.000 | | 0.300 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Development Support | WR | FRC-SW : North Island, CA | 0.613 | 0.210 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Development Support | WR | FRC-E : Cherry Point, NC | 0.105 | 0.350 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.455 | - |
| Development Support | WR | NSWC : Crane, IN | 0.000 | 0.160 | Dec 2015 | 0.000 | | 0.100 | Nov 2017 | - | | 0.100 | 0.000 | 0.260 | - |
| | | **Subtotal** | 8.718 | 0.720 | | 0.300 | | 0.100 | | - | | 0.100 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Test & Evaluation | Various | Various : Various | 3.392 | 0.000 | | 0.050 | Nov 2016 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Development Test & Evaluation | WR | NSWC : Crane, IN | 0.548 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.548 | - |
| | | **Subtotal** | 3.940 | 0.000 | | 0.050 | | 0.000 | | - | | 0.000 | - | - | - |

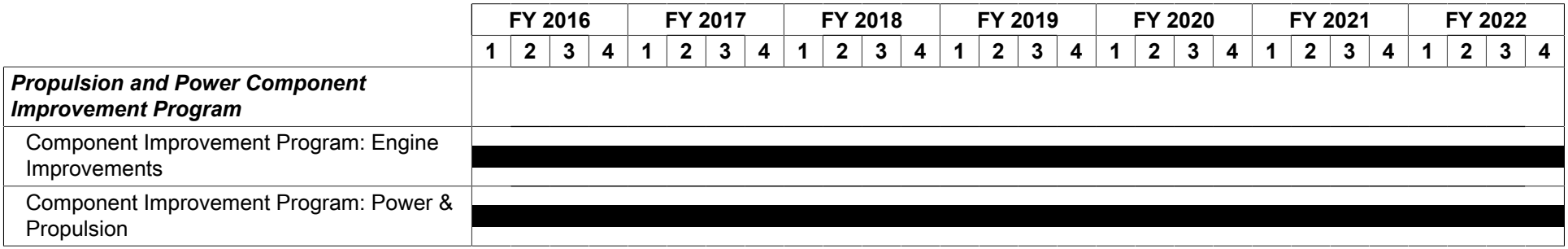
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | Various | NAVAIR : Patuxent River, MD | 0.698 | 0.035 | Oct 2015 | 0.048 | Oct 2016 | 0.051 | Oct 2017 | - | | 0.051 | Continuing | Continuing | Continuing |
| Prior Year Mgmt cost no longer funded in the FYDP | Various | Various : Various | 1.447 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.447 | - |
| | | **Subtotal** | 2.145 | 0.035 | | 0.048 | | 0.051 | | - | | 0.051 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 980.412 | 73.811 | | 93.543 | | 94.001 | | - | | 94.001 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>1355 / *Propulsion and Power Component Improvement Program* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Propulsion and Power Component Improvement Program*** | | | | |
| Component Improvement Program: Engine Improvements | 1 | 2016 | 4 | 2022 |
| Component Improvement Program: Power & Propulsion | 1 | 2016 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>2269 / *Expeditionary Airfield Improvements* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2269: *Expeditionary Airfield Improvements* | 24.057 | 17.838 | 14.948 | 12.359 | - | 12.359 | 3.774 | 0.804 | 0.000 | 0.000 | 0.000 | 73.780 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Expeditionary Airfields (EAF) program was a FY2012 New Start, with funding released to the project in May 2012. The EAF program designs, develops and tests a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment, the Marine Aircraft Wing Support Squadrons can support all United States Marine Corps (USMC) aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats. Milestone B moved from third quarter of fiscal year 2014 to first quarter of 2015 due to contract negotiation delays.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Expeditionary Airfields Improvements | 17.838 | 14.948 | 12.359 | 0.000 | 12.359 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The EAF program designs, develops, tests and fields a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment the Marine Aircraft Wing Support Squadron can support all USMC aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats. | | | | | |
| ***FY 2016 Accomplishments:***<br>Completion of the Preliminary Design Review (PDR) for hardware and software leading up to the completion of the critical design. Continue the design, development, and integration of the SLS program. | | | | | |
| ***FY 2017 Plans:***<br>Conduct Critical Design Review (CDR), Test Readiness Review (TRR), and begin Developmental testing(DT). | | | | | |
| ***FY 2018 Base Plans:***<br>Continue Developmental (DT) testing, conduct the Operational Test Readiness Review (OTRR) and Operational Testing (OT). | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>2269 / *Expeditionary Airfield Improvements* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 17.838 | 14.948 | 12.359 | 0.000 | 12.359 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/4213: *ASE-Expeditionary Airfields* | 8.425 | 7.984 | 8.230 | - | 8.230 | 8.438 | 8.603 | 8.830 | 9.006 | Continuing | Continuing |

**Remarks**

OPN 4213 includes a portion of line item funding for Expeditionary Airfields.

**D. Acquisition Strategy**

Expeditionary Airfields (EAF): Cost Plus Incentive Fee contract for the system design, development, integration and testing of the Sustainment Lighting System awarded in December 2014.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>2269 / *Expeditionary Airfield Improvements* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | WR | NAWCAD : Lakehurst, NJ | 11.089 | 6.740 | Nov 2015 | 6.151 | Nov 2016 | 4.021 | Nov 2017 | - | | 4.021 | 1.189 | 29.190 | - |
| Primary Hardware/ Software Development | C/CPIF | Tactical Lighting Systems, Inc : Addison, Illinois | 4.993 | 8.723 | Jan 2016 | 6.600 | Feb 2017 | 5.411 | Jan 2018 | - | | 5.411 | 2.165 | 27.892 | 27.892 |
| Prior year Prod Dev no longer funded in the FYDP | Various | Various : Various | 1.700 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.700 | - |
| | | **Subtotal** | 17.782 | 15.463 | | 12.751 | | 9.432 | | - | | 9.432 | 3.354 | 58.782 | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integrated Logistics | WR | NAWCAD : Lakehurst, NJ | 0.875 | 1.083 | Nov 2015 | 0.657 | Nov 2016 | 0.545 | Nov 2017 | - | | 0.545 | 0.429 | 3.589 | - |
| Prior Year Support no longer funded in the FYDP | Various | Various : Various | 3.637 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.637 | - |
| | | **Subtotal** | 4.512 | 1.083 | | 0.657 | | 0.545 | | - | | 0.545 | 0.429 | 7.226 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test and Evaluation | WR | NAWCAD : Lakehurst, NJ | 0.942 | 0.925 | Nov 2015 | 1.122 | Nov 2016 | 1.988 | Nov 2017 | - | | 1.988 | 0.380 | 5.357 | - |
| Opeval Test Support | WR | COMOPTEVFOR : Norfolk, VA | 0.069 | 0.057 | Nov 2015 | 0.113 | Nov 2016 | 0.166 | Nov 2017 | - | | 0.166 | 0.125 | 0.530 | - |
| | | **Subtotal** | 1.011 | 0.982 | | 1.235 | | 2.154 | | - | | 2.154 | 0.505 | 5.887 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0205633N / *Aviation Improvements* | Project (Number/Name)<br>2269 / *Expeditionary Airfield Improvements* | |

**Management Services ($ in Millions)**

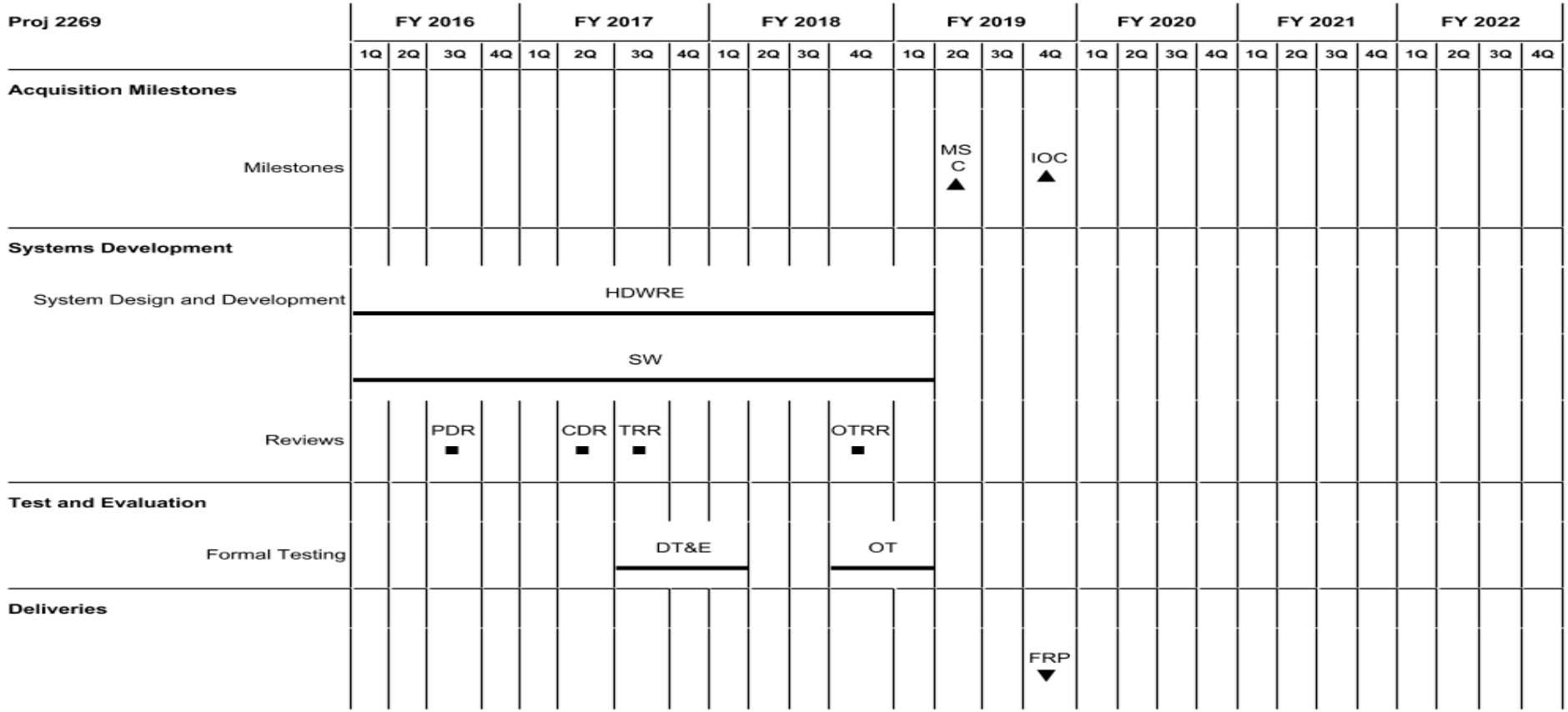
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Support Services | C/CPFF | Various : Various | 0.752 | 0.310 | Dec 2015 | 0.305 | Dec 2016 | 0.228 | Dec 2017 | - | | 0.228 | 0.290 | 1.885 | 1.885 |
| | | **Subtotal** | 0.752 | 0.310 | | 0.305 | | 0.228 | | - | | 0.228 | 0.290 | 1.885 | 1.885 |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 24.057 | 17.838 | | 14.948 | | 12.359 | | - | | 12.359 | 4.578 | 73.780 | - |

**Remarks**

Prior Year includes $4.9 million of Congressional Add funding.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>2269 / *Expeditionary Airfield Improvements* |




*2018OSD - 0205633N - 2269*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0205633N / *Aviation Improvements* | **Project (Number/Name)**<br>2269 / *Expeditionary Airfield Improvements* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2269*** | | | | |
| Acquisition Milestones: Milestones: Milestone C | 2 | 2019 | 2 | 2019 |
| Acquisition Milestones: Milestones: IOC | 4 | 2019 | 4 | 2019 |
| Systems Development: System Design and Development: Hardware Development | 1 | 2016 | 1 | 2019 |
| Systems Development: System Design and Development: Software Development | 1 | 2016 | 1 | 2019 |
| Systems Development: Reviews: Preliminary Design Review | 3 | 2016 | 3 | 2016 |
| Systems Development: Reviews: Critical Design Review | 2 | 2017 | 2 | 2017 |
| Systems Development: Reviews: Test Readiness Review | 3 | 2017 | 3 | 2017 |
| Systems Development: Reviews: Operational Test Readiness Review | 4 | 2018 | 4 | 2018 |
| Test and Evaluation: Formal Testing: Tech Eval/Dev T&E | 3 | 2017 | 1 | 2018 |
| Test and Evaluation: Formal Testing: Operational Testing | 4 | 2018 | 1 | 2019 |
| Deliveries: Delivery: Lot 1 | 4 | 2019 | 4 | 2019 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0205675N *I Operational Nuclear Power Sys* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 0.000 | 101.323 | 101.786 | 127.445 | - | 127.445 | 117.028 | 106.192 | 110.313 | 112.199 | Continuing | Continuing |
| 1303: *Operational Nuclear Power System* | 0.000 | 101.323 | 101.786 | 127.445 | - | 127.445 | 117.028 | 106.192 | 110.313 | 112.199 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 101.323 | 101.786 | 123.969 | - | 123.969 |
| Current President's Budget | 101.323 | 101.786 | 127.445 | - | 127.445 |
| Total Adjustments | 0.000 | 0.000 | 3.476 | - | 3.476 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 3.476 | - | 3.476 |

**Change Summary Explanation**

Technical: Not applicable.
Schedule: Not applicable.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0206313M *I Marine Corps Comms Systems* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 1,321.272 | 84.017 | 118.146 | 123.825 | - | 123.825 | 95.243 | 85.908 | 87.074 | 89.427 | Continuing | Continuing |
| 2270: *Exp Indirect Fire Gen Supt Wpn Sys* | 248.364 | 21.436 | 25.381 | 27.484 | - | 27.484 | 26.103 | 26.363 | 26.947 | 27.483 | Continuing | Continuing |
| 2273: *Air Ops Cmd & Control (C2) Sys* | 413.245 | 10.969 | 13.219 | 14.630 | - | 14.630 | 11.423 | 10.965 | 11.240 | 11.463 | Continuing | Continuing |
| 2274: *Command & Control Warfare Sys* | 32.950 | 8.533 | 6.531 | 8.129 | - | 8.129 | 8.233 | 7.054 | 7.214 | 7.358 | Continuing | Continuing |
| 2275: *Marine Corps Tactical Radio Systems* | 36.429 | 4.929 | 15.161 | 22.722 | - | 22.722 | 11.329 | 8.119 | 8.190 | 8.453 | Continuing | Continuing |
| 2276: *Comms Switching and Control Sys* | 40.765 | 1.938 | 2.216 | 2.799 | - | 2.799 | 2.618 | 2.748 | 2.808 | 2.663 | Continuing | Continuing |
| 2277: *System Engineering and Integration* | 38.330 | 5.013 | 4.861 | 8.314 | - | 8.314 | 5.582 | 6.079 | 6.395 | 6.402 | Continuing | Continuing |
| 2278: *Air Defense Weapons System* | 44.734 | 1.635 | 35.009 | 24.214 | - | 24.214 | 6.237 | 6.081 | 6.074 | 6.065 | Continuing | Continuing |
| 2510: *MAGTF CSSE & SE* | 281.492 | 13.040 | 2.345 | 1.518 | - | 1.518 | 1.340 | 1.369 | 1.488 | 1.508 | Continuing | Continuing |
| 3099: *Radar System* | 184.963 | 3.972 | 13.423 | 14.015 | - | 14.015 | 22.378 | 17.130 | 16.718 | 18.032 | Continuing | Continuing |
| 9999: *Congressional Adds* | 0.000 | 12.552 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.552 |

**A. Mission Description and Budget Item Justification**

This program element provides funding to develop the command and control (C2) support and information infrastructures for the Fleet Marine Force and supporting establishment. Doctrinally, the C2 support system and the information infrastructure form two parts of a triad of capabilities which permits command and control systems to be transformed into a complete operating system. The third element of the triad is command and control organization and is not covered in this program element. USMC command and control is divided into seven functional areas and one supporting functional area as follows: intelligence C2, fire support C2, air operations C2, radio systems C2, combat service support C2, warfare C2, radar systems C2, and C2 support (information processing and communications).

Within this program element, subprojects have been grouped by C2 functional area for more efficient planning. Air defense weapons systems have been added to facilitate planning and a separate project is used for systems assigned to the supporting establishment. Subprojects which support the Commander's decision processes have been collected into the Command Post Systems project since these systems must work in close cooperation to ensure effective C2 of Marine Air Ground Task Forces.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0206313M *I Marine Corps Comms Systems* |

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 77.909 | 82.159 | 94.060 | - | 94.060 |
| Current President's Budget | 84.017 | 118.146 | 123.825 | - | 123.825 |
| Total Adjustments | 6.108 | 35.987 | 29.765 | - | 29.765 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 7.738 | 0.000 | | | |
| • SBIR/STTR Transfer | -1.631 | 0.000 | | | |
| • Program Adjustments | 0.000 | 35.987 | 29.315 | - | 29.315 |
| • Rate/Misc Adjustments | 0.001 | 0.000 | 0.450 | - | 0.450 |

| Congressional Add Details ($ in Millions, and Includes General Reductions) | FY 2016 | FY 2017 |
|---|---|---|
| **Project:** 9999: *Congressional Adds* | | |
| Congressional Add: *Radar Enhancements* | 12.552 | 0.000 |
| Congressional Add Subtotals for Project: 9999 | 12.552 | 0.000 |
| Congressional Add Totals for all Projects | 12.552 | 0.000 |

**Change Summary Explanation**

The funding increase of $5.679M from FY17 to FY18 can be attributed to improvements and enhancements to Exp Indirect Fire Gen Supt Wpn Sys, Air Operations C2 systems, Command and Control Warfare Systems, Tactical Radio Systems, and System Engineering and Integration.

Exp Indirect Fire Gen Supt Wpn Sys funding increases will support the development, integration, and testing of several C2 systems to include all Marine Air Ground Task Force (MAGTF) Command and Control (C2) Systems and Applications (MAGTF C2 SA). Additionally, increased funding will support development of Handheld Command and Control capabilities, to include test and evaluation and systems engineering activities in FY18.

Command and Control Air Operation System - Command and Control Information Services (C2AOS-C2IS) is an ACAT III, post Milestone B, Air Force led program with joint interest. The funding increase will allow for USMC participation in the Air Force scheduled Warfighter Assessments, Developmental Testing, and Multi-service Operational Testing and Evaluation (MOT&E) to ensure USMC requirements will be met.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0206313M *I Marine Corps Comms Systems* |

Command and Control Warfare systems increase to Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) will fund test and evaluation supporting mounted CREW development efforts.

Tactical Radio Systems will continue development of the Next Generation Troposcatter (NGT). The NGT is a transit case solution which will replace the AN/TRC-170A. The funding increase from FY17 to FY18 supports the NGT MILSTD c/x-band testing and engineering support. Additionally, TCM will continue development and testing of Joint Enterprise Network Manager (JENM) and the testing and evaluation of High Frequency Radio II (HFR II) and Multi-Band Radio (MBR) Replacement.

Under Systems Engineering and Integration, the funding increase establishes the Military Information Support Operations (MISO) program to develop and test a Marine Corps variant of the Special Operations Command Fly Away Broadcast System. MISO capabilities are critical to the success of the MAGTF mission, enabling commanders to shape the information environment, counter enemy propaganda, misinformation, disinformation, and adversarial narratives.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2270: *Exp Indirect Fire Gen Supt Wpn Sys* | 248.364 | 21.436 | 25.381 | 27.484 | - | 27.484 | 26.103 | 26.363 | 26.947 | 27.483 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

NOTE: The increase of $2.103M from FY17 to FY18 will fund improvements and enhancements to Software Release, Marine Corps Enterprise Information Technology Services (MCEITS), and Marine Corps Software Resource Center (MCSRC).

**A. Mission Description and Budget Item Justification**

Marine Air Ground Task Force (MAGTF) Command and Control (C2) Systems and Applications (MAGTF C2 SA) - MAGTF C2 SA merges the development, integration and testing of 45 existing C2 systems and applications into one common enterprise capability. They reside in all Combat Operations Centers (COCs) and related USMC C2 platforms. This effort provides greater economies of scale/affordability with system developers, technical design agents, integration agents and individual program offices. MAGTF C2 SA efforts are in alignment with the combat developers requirements for: Net-Centric systems, Development of reusable Open Architecture components, Data exposure, Enhancing the Warfighter's Situational Awareness and Increasing/Maximizing the Commander's decision space.

Joint Battle Command - Platform (JBC-P) Family of Systems (FoS) - JBC-P FoS is an Army led ACAT II program of Joint Requirements Oversight Council (JROC) interest, formerly known as the Blue Force Tracker (BFT) FoS. It is comprised of L-Band SATCOM and is a digital, battle command information FoS that provides integrated, on the move, timely, relevant Command and Control Situational Awareness (C2SA) information to tactical combat, combat support and combat service support commanders, leaders, and key C2 nodes. JBC-P FoS will provide JROC mandated C2SA convergence across aircraft, ground vehicles and dismounted personnel.

Global Command and Control System - Tactical Command Operations System (GCCS-TCO) - GCCS-TCO is the principal tool within the Marine Air Ground Task Force (MAGTF) for situational awareness through distribution of the Common Tactical Picture (CTP). It supports tactical operations providing information via high speed computer systems in a timely manner and includes the Intel Operations Workstations/Servers. R&D funds provide science and technology advanced concepts to be applied to the system for an increase in functional capabilities to the warfighter, to include Joint Command and Control (JC2) development efforts within Tactical Service Oriented Architecture (TSOA).

Identity Dominance System-MC (IDS-MC) - IDS-MC is a multi-modal (fingerprint, iris and face) biometric collection system that provides the USMC a reliable and effective capability to collect, share, match, access, verify and store identity information. IDS-MC will enable the Marine to collect appropriate biometric, biographical and reference information on an individual and match this locally developed information with pre-existing information available to the expeditionary force. The system will display match results with linkage to the respective individual's biographical and reference information as well as help analyze the response, update records as appropriate, create reports and disseminate updated information. The primary mission of IDS-MC is to provide the Marine Corps with the means to identify persons encountered in the battle space. While IDS-MC is not an intelligence analysis system, it does provide identification information in support of military intelligence and

law enforcement operations by providing positive identification of persons of interest. IDS-MC is an enabler in the areas of detainee management and questioning, base access, counterintelligence screening, border control, law enforcement, displaced persons' management and aiding in humanitarian assistance missions. IDS-MC supports the tactical application of identity dominance and fully supports a forward presence, crisis response and contingency response capability.

Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS) - AFATDS FoS consists of three programs, AFATDS, Back Up Computer System (BUCS) and Mobile Tactical Shelter (MTS). The AFATDS automates the fire planning, tactical fire direction, and fire support coordination required to support maneuver from the sea and subsequent operations ashore. AFATDS integrates all supporting arms assets within the MAGTF such as mortars, cannon artillery, rockets and missiles, close air support, and naval surface fire support systems. BUCS is a hand-held computer system designed to provide a backup to the AFATDS in computing ballistic firing solutions, as well as provide survey and Meteorological functions in support of artillery. Additionally BUCS is the primary ballistic firing solution system during Ship To Objective Maneuver (STOM) and for the Expeditionary Fire Support System (EFSS). The MTS is a Lightweight Multi-purpose Shelter mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) which protects both the AFATDS and operators from the environment. MTS enables rapid emplacement and displacement of fire support elements and provides networked communications on the move.

Target Hand-Off System (THS) - The THS addressed a Marine Corps operational requirement for a lightweight, handheld, and accurate target acquisition engagement coordination system. THS provides MAGTF Commanders with the only man-portable target location capability that allows Air Officers and Fire Support Coordinators to prosecute identified targets. The THS' advance interoperability capability provides the MAGTF Commander with the only portable target acquisition system able to interoperate with all target prosecution platforms available in the battlefield. The THS is designed for the Forward Air Controllers (FACs), Forward Observers (FOs), Fire Support Teams (FSTs), Firepower Control Teams (FCTs), Tactical Air Control Parties (TACPs) and Reconnaissance Teams to quickly acquire targets in day, night and near-all-weather visibility conditions, in order to conduct precise, rapid indirect surface fire support, Naval Surface Fire Support (NSFS) and Close Air Support (CAS).

Handheld Command and Control (H2C2) - H2C2 project vision outlines a collective and efficient mobile computing Acquisition Strategy to ensure economies of scale and scope. The H2C2 portfolio consists of two specific capabilities - secure wireless access to multiple networks and handheld communication platforms. The handheld capability provides low cost (commercially available) platforms (smartphones and tablets) for use on every network regardless of the operational environment. The emerging technologies will enable access to both classified and unclassified systems on a single device. The secure wireless capability enables Marines burdened by wired implementations an option to leverage wireless mediums. This capability provides wireless communication between a variety of devices. Starting in FY18, Handheld efforts were re-aligned from JBC-P program.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** MAGTF C2: Product Development | 7.783 | 7.198 | 9.548 | 0.000 | 9.548 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued improving and enhancing MAGTF interoperability using the service oriented architecture provided by the TSOA. This greatly enhances the efficiency of data distribution between architecturally disparate tactical data systems. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued developing presentation layer applications in conjunction with Warfighter input using the Agile Application Development (A2D) process.<br>-Completed transition of selected Command and Control Personal Computer (C2PC)/Joint Common Operational Picture Tactical Workstation (JTCW) application functionality into services hosted on the TSOA framework and C2 software packages.<br>-Continued research and development for transfer of legacy stove-piped MAGTF C2 systems to modern interoperable applications resulting in a more efficient Joint and Coalition C2 environment for the MAGTF. Funding provided for the development of one major release and one Rapid Response and Integration (R2I) application.<br>***FY 2017 Plans:***<br>-Continue the addition of Authoritative Data Sources from Intelligence, Logistics and Operations to the TSOA in order to meet identified Marine Corps gaps.<br>-Continue improving and enhancing MAGTF interoperability using the service oriented architecture provided by the TSOA.<br>-Continue developing applications for the Marine Corps Software Resource Center to enable more effective information sharing and the ability for Marines to make more informed and timely decisions.<br>-Continue research and development for the deployment of the TSOA to additional Marine Corps platforms (NOTM and MCEITS).<br>***FY 2018 Base Plans:***<br>-Continue the addition of Authoritative Data Sources from Intelligence, Logistics and Operations to the TSOA in order to meet identified Marine Corps gaps.<br>-Continue improving and enhancing MAGTF interoperability using the service oriented architecture provided by the TSOA.<br>-Continue developing applications for the Marine Corps Software Resource Center to enable more effective information sharing and the ability for Marines to make more informed and timely decisions.<br>-Continue research and development for the deployment of the TSOA to additional Marine Corps platforms (NOTM and MCEITS).<br>- The increase of $2.350M from FY17 to FY18 will fund improvements and enhancements to Software Release, Marine Corps Enterprise Information Technology Services (MCEITS), and Marine Corps Software Resource Center (MCSRC).<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** MAGTF C2: Support Costs | 1.022 | 1.208 | 1.369 | 0.000 | 1.369 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued system engineering support for system integration, configuration management and technical assessments.<br>***FY 2017 Plans:***<br>- Continue system engineering support for system integration, configuration management and technical assessments.<br>***FY 2018 Base Plans:***<br>- Continue system engineering support for system integration, configuration management and technical assessments.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** MAGTF C2: Test and Evaluation | 1.000 | 1.425 | 1.659 | 0.000 | 1.659 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued test support for the Joint Tactical Common Operational (COP) Workstation (JTCW).<br>-Continued conducting developmental testing of JTCW and Joint interoperability testing in conjunction with the Joint Interoperability Test Command (JITC).<br>-Continued to participate in technical working groups in support of test and engineering.<br>-Continued to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating forces Tactical Systems Support Center (OFTSSC) trouble calls.<br>***FY 2017 Plans:***<br>-Continue test support for the Joint Tactical Common Operational (COP) Workstation (JTCW).<br>-Continue conducting developmental testing of JTCW and Joint interoperability testing in conjunction with the Joint Interoperability Test Command (JITC).<br>-Continue to participate in technical working groups in support of test and engineering. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating forces Tactical Systems Support Center (OFTSSC) trouble calls.<br>***FY 2018 Base Plans:***<br>-Continue test support for the Joint Tactical Common Operational (COP) Workstation (JTCW).<br>-Continue to participate in technical working groups in support of test and engineering.<br>-Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating forces Tactical Systems Support Center (OFTSSC) trouble calls<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** MAGTF C2: Management Services | 1.000 | 1.275 | 1.300 | 0.000 | 1.300 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews and prime vendor oversight from Federally Funded Research and Development Center (FFRDC).<br>***FY 2017 Plans:***<br>Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews and prime vendor oversight from Federally Funded Research and Development Center (FFRDC).<br>***FY 2018 Base Plans:***<br>Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews and prime vendor oversight from Federally Funded Research and Development Center (FFRDC).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GCCS-TCO: Product Development | 0.044 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>- Completed the development of services linking the COP from GCCS-TCO to other COP viewing tools as a service inside the Combat Operations Center. The GCCS-TCO software improved interoperability with the Tactical Service Oriented Architecture, allowing COP and Situational Awareness data to be shared between the GCCS-TCO and other C2 systems.<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GCCS-TCO: Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Completed Engineering Support personnel and travel<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 0.106<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** AFATDS: Software Development and Integration<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Initiated development of AFATDS software V6.8.1.1 P2<br>***FY 2017 Plans:*** | 1.444<br>- | 4.901<br>- | 4.565<br>- | 0.000<br>- | 4.565<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue development of AFATDS software version 6.8.1.1 P2<br>***FY 2018 Base Plans:***<br>- Complete development of AFATDS software version 6.8.1.1 P2<br>- Initiate development of AFATDS software version 7.0<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AFATDS: Test and Evaluation | 0.861 | 0.435 | 0.305 | 0.000 | 0.305 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Initiated interoperability testing for AFATDS and BUCS software between all required Joint C2 and Fires systems<br>- Initiated initial tests to support G/ATOR and PERM Initial Operational Test and Evaluation (IOT&E) of functionality within AFATDS software version 6.8.1.1. P2.<br>***FY 2017 Plans:***<br>- Continue tests to support G/ATOR and PERM Initial Operational Test and Evaluation (IOT&E) of functionality within AFATDS software version 6.8.1.1. P2.<br>- Continue interoperability testing for AFATDS and BUCS software between all required Joint C2 and Fires systems.<br>***FY 2018 Base Plans:***<br>- Complete tests to support G/ATOR and PERM Initial Operational Test and Evaluation (IOT&E) of functionality within AFATDS software version 6.8.1.1. P2.<br>- Continue interoperability testing for AFATDS and BUCS software between all required Joint C2 and Fires systems.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AFATDS: Management Services | 0.160 | 0.650 | 1.011 | 0.000 | 1.011 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued Engineering Support personnel and travel<br>***FY 2017 Plans:***<br>-Continue to provide Engineering Support personnel and travel<br>***FY 2018 Base Plans:***<br>-Continue to provide Engineering Support personnel and travel<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** THS: Product Development<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Continued capability requirements analysis and validation and conducted analysis of future interoperability and capability requirements.<br>-Initiated development of emerging requirements and incorporated software patches to improve interoperability.<br>***FY 2017 Plans:***<br>-Complete development of the first software version to support fielding and replace THS V1, which will be obsolete and unsupportable after FY17.<br>-Initiate the development of the next iteration of THS software.<br>***FY 2018 Base Plans:***<br>-Continue development of THS V2 software.<br>***FY 2018 OCO Plans:***<br>N/A | 2.981<br>- | 2.273<br>- | 1.661<br>- | 0.000<br>- | 1.661<br>- |
| ***Title:*** JBC-P: Software and Product Development/Integration<br>***Articles:***<br>***Description:*** NOTE: Decrease of $1.528M from FY17 to FY18 is aligned to the schedule for test and evaluation and systems engineering. Starting in FY18, Handheld efforts were re-aligned to H2C2 program.<br>***FY 2016 Accomplishments:***<br>-Continued coordination with the software and product development teams to assist in the development and integration of the JBC-P software capability and associated testing. | 0.627<br>- | 2.756<br>- | 1.393<br>- | 0.000<br>- | 1.393<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued software engineering support to provide appropriate government direction in design and development of software.<br>***FY 2017 Plans:***<br>-Continue coordination with the software and product development teams to assist in the development and integration of the JBC-P software capability and associated testing.<br>-Continue software engineering support to provide appropriate government direction in design and development of software.<br>***FY 2018 Base Plans:***<br>-Continue coordination with the software and product development teams to assist in the development and integration of the JBC-P software capability and associated testing.<br>-Continue software engineering support to provide appropriate government direction in design and development of software.<br>-Decrease of $1.363 from FY17 to FY18 due to movement of Handheld efforts from JBC-P to H2C2 in FY18.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** JBC-P: Test and Evaluation | 0.342 | 0.490 | 0.325 | 0.000 | 0.325 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued laboratories integration to facilitate test and network integration test events.<br>***FY 2017 Plans:***<br>-Continue laboratories integration to facilitate test and network integration test events.<br>***FY 2018 Base Plans:***<br>-Continue laboratories integration to facilitate test and network integration test events.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** IDS-MC: Product Development | 0.505 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued software development and hardware integration including information assurance and cyber-security certification and accreditation.<br>- Continued system engineering and network integration of emerging requirements.<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** IDS-MC: Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Continued software development support and hardware integration including information assurance and cyber-security certification and accreditation.<br>- Continued system engineering and network integration support for emerging requirements.<br>***FY 2017 Plans:***<br>- Continue software development and hardware integration including information assurance and cyber security certification and accreditation.<br>- Continue system engineering and network integration of emerging requirements.<br>- Initiate capability requirements analysis and initiate development for IDS-MC increment 2.<br>***FY 2018 Base Plans:***<br>- Continue to develop, assess, and integrate emerging technologies for the IDS-MC Increment 2 integrated system design.<br>***FY 2018 OCO Plans:***<br>N/A | 0.300<br>- | 0.900<br>- | 0.883<br>- | 0.000<br>- | 0.883<br>- |
| ***Title:*** IDS-MC: Test and Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:*** | 0.000<br>- | 0.128<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2017 Plans:***<br>Initiate Engineering Change Proposal testing IDS-MC Increment 2 technology demonstrations and engineering testing which includes purchasing hardware COTS test articles for technology assessment for IDS-MC Increment 2.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** H2C2: Test and Evaluation<br>***Articles:***<br>***Description:*** NOTE: Increase of $1.723M from FY17 to FY18 is aligned to the schedule for test and evaluation and systems engineering.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>-Initiate test and evaluation efforts for Handheld end user device.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 1.681<br>- | 0.000<br>- | 1.681<br>- |
| ***Title:*** H2C2: Integration Engineering<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Continued to develop, design, test, and integrate various emerging capabilities across the H2C2 portfolio.<br>-Continued to provide support for sustained engagement with various industry providers, quick look technology excursions, and experimentation demonstrations for high risk emerging technology. | 3.261<br>- | 1.742<br>- | 1.784<br>- | 0.000<br>- | 1.784<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued support for development and planning of handheld device.<br>***FY 2017 Plans:***<br>-Continue to develop, design, test, and integrate various emerging capabilities across the H2C2 portfolio.<br>-Continue to provide support for sustained engagement with various industry providers, quick look technology excursions, and experimentation demonstrations for high risk emerging technology.<br>-Continue support for developmental test (DT) and for handheld device.<br>***FY 2018 Base Plans:***<br>-Continue to develop, design, test, and integrate various emerging capabilities across the H2C2 portfolio.<br>-Continue to provide support for sustained engagement with various industry providers, quick look technology excursions, and experimentation demonstrations for high risk emerging technology.<br>-Continue support for certification and accreditation efforts for handheld device.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 21.436 | 25.381 | 27.484 | 0.000 | 27.484 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/6438BB: *IDS-MC* | 2.693 | 0.496 | 0.498 | - | 0.498 | 1.001 | 5.070 | 1.041 | 1.062 | Continuing | Continuing |
| • PMC/4631CC: *GCCS-TCO* | 0.000 | 6.005 | 3.264 | - | 3.264 | 0.789 | 1.827 | 9.501 | 0.098 | Continuing | Continuing |
| • PMC/4631DD: *AFATDS* | 2.695 | 2.826 | 15.520 | 0.177 | 15.697 | 15.244 | 15.562 | 15.865 | 16.182 | Continuing | Continuing |
| • PMC/4631FF: *JBC-P* | 12.426 | 34.558 | 29.740 | - | 29.740 | 8.421 | 8.593 | 8.760 | 8.935 | Continuing | Continuing |
| • PMC/4631GG: *THS* | 3.961 | 0.000 | 22.350 | - | 22.350 | 24.741 | 2.440 | 2.487 | 2.537 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

MAGTF C2 SA: MAGTF C2 SA is delivering command and control capabilities through bi-annual software releases with an initial release in FY15 through multiple programs of record. In FY16, there were multiple releases to modernize the service oriented infrastructure and pull in more services from Authoritative Data Sources. In FY17 there will be multiple releases to pull in more services and deploy to additional platforms beyond the Combat Operations Center. Currently the initial focus is developing the Tactical Service Oriented Architecture (TSOA) software, which provides a common software infrastructure through which services and applications from other programs of record can begin the process of interfacing with in order to maximize software commonality across echelons and missions. The long term goal is

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

a software capability that will enable data discovery and data sharing across mission areas, a common standards-based viewer, core services and applications, and access to the Global Information Grid (GIG) and other Joint networks, data and services.

JBC-P: JBC-P FoS is leveraging the Army's development of the JBC-P. The Marine Corps program is contingent upon the Army's development and acquisition strategy. The Army will fund research and development for JBC-P unless there are Service unique requirements, which the Marine Corps program office will fund. The Marine Corps program office will participate in all design and readiness reviews and joint operational testing events.

GCCS-TCO: Contracting is performed with various vendors for software test and integration, Commercial-Off-The-Shelf (COTS) evaluation and documentation to develop advanced concepts and additional functional capabilities. The Program Management Office conducts quarterly performance reviews. Specific hardware is also procured for test purposes which include environmental, shock, compatibility, and interoperability testing.

Identity Dominance System (IDS): For IDS-MC Increment 1, the Program Office acquisition strategy leveraged the Navy's IDS Program and provide funding to enhance the Navy's system to meet Marine Corps requirements. The Marine Corps program office participated in all design and technical reviews as well as the FOT&E activities. For IDS-MC Increment 2, the Marine Corps Program Office is collaborating with the Army and Navy to leverage market research and technology demonstration data for system hardware and software selection in support of technical refresh. The Marine Corps plans to conduct technology assessments in FY17, conduct PDR and CDR in FY18, MS C in FY19, and Full Deployment Decision (with system procurement) in FY20. and The long-term goal is to equip the Marine with a user-friendly biometric authentication technology that will be employed throughout DoD to deny the enemy freedom of movement within the populace and positively identify known insurgents within an Area of Responsibility (AOR). R&D efforts will be a combined effort with the Navy PM and the USMC for IDS Increment 2, and led by the Marine Corps Program Office.

AFATDS: AFATDS is managed through Army CECOM, Aberdeen Proving Ground, MD. R&D efforts for the next AFATDS version will be a combined effort between the software developer, the Army PM, and the USMC for software enhancements through DISA. Current software enhancements are performed at Army, Ft. Sill, OK.

THS: The acquisition of components (software/hardware) for the THS initiative will maximize the use of existing COTS, Government-Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and Government Furnished Equipment (GFE). Software is transitioning to a government owned baseline. Software must maintain compatibility with five Programs of Record (POR) and seven Operational Flight Programs (OFP).

H2C2: H2C2 will use an evolutionary approach for technology insertion. The approach will leverage and mature COTS and NDI technologies to rapidly transition a handheld data capability to other acquisition programs. H2C2 inserts mature technology into existing programs in order to fill capability gaps and requirement shortfalls. These technologies will be inserted at different times along gaining program acquisition cycles. This strategy will apply to available technology at different proposed technology insertion points for each gaining program.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAGTF C2 | C/CPFF | SPAWAR : Charleston, SC | 47.566 | 3.360 | Mar 2016 | 1.598 | Jan 2017 | 5.848 | Apr 2018 | - | | 5.848 | Continuing | Continuing | Continuing |
| MAGTF C2 | WR | NSWC : Panama City, FL | 0.736 | 0.250 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MAGTF C2 | WR | NSWC : Dahlgren, VA | 9.538 | 1.500 | Sep 2016 | 1.800 | May 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MAGTF C2. | C/CPFF | SPAWAR : San Diego, CA | 4.232 | 1.123 | Jul 2016 | 1.000 | May 2017 | 1.200 | Apr 2018 | - | | 1.200 | Continuing | Continuing | Continuing |
| MAGTF C2 | WR | SSC A : Charleston, SC | 5.343 | 1.250 | Feb 2016 | 1.800 | Jan 2017 | 2.000 | Feb 2018 | - | | 2.000 | Continuing | Continuing | Continuing |
| MAGTF C2 | WR | ARL : Washington, DC | 0.983 | 0.300 | Sep 2016 | 0.700 | May 2017 | 0.500 | Mar 2018 | - | | 0.500 | Continuing | Continuing | Continuing |
| MAGTF C2 | C/CPFF | NSWC2 : Dahlgren, VA | 0.260 | 0.000 | | 0.300 | Feb 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| GCCS-TCO | C/CPFF | MCSC : Quantico, VA | 5.691 | 0.044 | Jul 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.735 | - |
| AFATDS | MIPR | PM Mission Cmd (Army) : Aberdeen Proving Ground, MD | 31.640 | 1.099 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 32.739 | - |
| AFATDS | MIPR | DISA : Belleville, IL | 0.000 | 0.000 | | 3.836 | Mar 2017 | 3.893 | Mar 2018 | - | | 3.893 | Continuing | Continuing | Continuing |
| AFATDS | MIPR | Army/SEC : Fort Sill, OK | 0.000 | 0.000 | | 1.500 | Mar 2017 | 1.318 | Mar 2018 | - | | 1.318 | Continuing | Continuing | Continuing |
| AFATDS | WR | NSWC, Indian Head : Indian Head, MD | 0.000 | 0.345 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.345 | - |
| THS | SS/CPFF | Stauder Tech : St. Louis, MO | 23.769 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| THS | MIPR | AMRDEC : Huntsville, AL | 2.432 | 2.981 | May 2016 | 2.273 | Mar 2017 | 1.661 | Mar 2018 | - | | 1.661 | Continuing | Continuing | Continuing |
| JBC-P | WR | SPAWAR : Charleston, SC | 2.990 | 0.221 | Dec 2015 | 0.299 | Jan 2017 | 0.287 | Dec 2017 | - | | 0.287 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JBC-P | C/CPFF | SPAWAR2 : Charleston, SC | 0.386 | 0.195 | Dec 2015 | 0.241 | May 2017 | 0.211 | Dec 2017 | - | | 0.211 | Continuing | Continuing | Continuing |
| JBC-P | C/CPFF | NSWC2 : Crane, IN | 0.000 | 0.211 | Dec 2015 | 0.188 | Jun 2017 | 0.386 | Dec 2017 | - | | 0.386 | Continuing | Continuing | Continuing |
| JBC-P | WR | DPSS : China Lake, CA | 0.000 | 0.000 | | 0.565 | Feb 2017 | 0.509 | Feb 2018 | - | | 0.509 | Continuing | Continuing | Continuing |
| JBC-P | WR | DPSS2 : China Lake, CA | 0.000 | 0.000 | | 1.463 | Jul 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.463 | - |
| IDS-MC | MIPR | NAVSEA/PMS-408 : Washington, DC | 1.971 | 0.505 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | Various : Various | 67.411 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 204.948 | 13.384 | | 17.563 | | 17.813 | | - | | 17.813 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAGTF C2 | WR | SPAWAR : San Diego, CA | 3.926 | 1.022 | Feb 2016 | 1.208 | Jan 2017 | 1.369 | Feb 2018 | - | | 1.369 | Continuing | Continuing | Continuing |
| H2C2 Integration Eng | WR | SPAWAR : Charleston, SC | 1.192 | 1.381 | Dec 2015 | 0.937 | Dec 2016 | 0.200 | Dec 2017 | - | | 0.200 | Continuing | Continuing | Continuing |
| H2C2 Integration Eng | C/FFP | SPAWAR : Charleston, SC | 0.181 | 0.188 | Jul 2016 | 0.295 | Dec 2016 | 0.255 | Dec 2017 | - | | 0.255 | Continuing | Continuing | Continuing |
| H2C2 Integration Eng | WR | NSWC Crane : Crane, IN | 0.000 | 0.626 | Dec 2015 | 0.510 | Nov 2016 | 0.295 | Nov 2017 | - | | 0.295 | Continuing | Continuing | Continuing |
| H2C2 Integration Eng | C/FFP | CECOM/MITRE : Monmouth, NJ | 0.000 | 0.291 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.291 | - |
| H2C2 Integration Eng | WR | NSWC China Lake : China Lake, CA | 0.000 | 0.615 | Mar 2016 | 0.000 | | 0.819 | Dec 2017 | - | | 0.819 | Continuing | Continuing | Continuing |
| H2C2 Integration Eng | C/CPFF | NSWC Crane2 : Crane, IN | 0.000 | 0.060 | Sep 2016 | 0.000 | | 0.115 | Jun 2018 | - | | 0.115 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H2C2 Integration Eng | Various | MCSC : Stafford, VA | 0.000 | 0.100 | Nov 2015 | 0.000 | | 0.100 | Nov 2017 | - | | 0.100 | Continuing | Continuing | Continuing |
| IDS-MC | WR | NSWC Dahlgren : Dahlgren, VA | 2.721 | 0.300 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.021 | - |
| IDS-MC | WR | SPAWAR : Charleston, SC | 0.036 | 0.000 | | 0.900 | Nov 2016 | 0.883 | Nov 2017 | - | | 0.883 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | Various : Various | 6.763 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.763 | - |
| | | **Subtotal** | 14.819 | 4.583 | | 3.850 | | 4.036 | | - | | 4.036 | - | - | - |

**Remarks**

IDS FY17-FY18: IDS-MC will utilize SPAWAR Atlantic to provide Lab support for technology assessment for IDS-MC increment 2 or technology refresh.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAGTF C2 | WR | NRL : Washington, DC | 2.083 | 0.250 | Apr 2016 | 0.825 | May 2017 | 0.859 | Feb 2018 | - | | 0.859 | Continuing | Continuing | Continuing |
| MAGTF C2 | C/ FFPLOE | MCTSSA. : Camp Pendleton, CA | 2.141 | 0.750 | Feb 2016 | 0.600 | Apr 2017 | 0.800 | Jan 2018 | - | | 0.800 | Continuing | Continuing | Continuing |
| THS | MIPR | DISA/JITC : Ft. Huachuca, AZ | 0.689 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| JBC-P | C/CPFF | MCTSAA : Camp Pendleton, CA | 0.979 | 0.219 | Mar 2016 | 0.287 | Dec 2016 | 0.235 | Mar 2018 | - | | 0.235 | Continuing | Continuing | Continuing |
| JBC-P | WR | SPAWAR : Charleston, SC | 1.654 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| JBC-P | MIPR | DISA/JITC : Ft Huachuca, AZ | 0.130 | 0.123 | Feb 2016 | 0.000 | | 0.090 | Feb 2018 | - | | 0.090 | Continuing | Continuing | Continuing |
| JBC-P | WR | NSWC Corona4 : Norco, CA | 0.000 | 0.000 | | 0.074 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.074 | - |
| JBC-P | C/FFP | NSWC Corona 5 : Norco, CA | 0.000 | 0.000 | | 0.129 | Jun 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.129 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IDS-MC | WR | NSWC : Crane, IN | 0.000 | 0.000 | | 0.128 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.128 | - |
| AFATDS | MIPR | PM Mission Cmd (Army) : Aberdeen Proving Ground, MD | 0.000 | 0.861 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.861 | - |
| H2C2 | WR | SPAWAR1 : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 0.335 | Dec 2017 | - | | 0.335 | 0.000 | 0.335 | - |
| H2C2 | WR | NSWC Corona : Norco, CA | 0.000 | 0.000 | | 0.000 | | 0.865 | Dec 2017 | - | | 0.865 | 0.000 | 0.865 | - |
| H2C2 | C/FFP | SPAWAR2 : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 0.200 | Dec 2017 | - | | 0.200 | 0.000 | 0.200 | - |
| H2C2 | C/FFP | NSWC Corona : Norco, CA | 0.000 | 0.000 | | 0.000 | | 0.200 | Dec 2017 | - | | 0.200 | 0.000 | 0.200 | - |
| H2C2 | WR | NSWC China Lake : China Lake, CA | 0.000 | 0.000 | | 0.000 | | 0.081 | Dec 2017 | - | | 0.081 | 0.000 | 0.081 | - |
| Prior Years Cumulative Funding | Various | VARIOUS : VARIOUS | 12.484 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 12.484 | - |
| | | **Subtotal** | 20.160 | 2.203 | | 2.043 | | 3.665 | | - | | 3.665 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAGTF C2 | C/CPFF | CECOM/MITRE : Ft. Monmouth, NJ | 5.252 | 1.000 | Jan 2016 | 1.275 | May 2017 | 1.300 | Dec 2017 | - | | 1.300 | Continuing | Continuing | Continuing |
| AFATDS | C/CPFF | CECOM/MITRE : Ft. Monmouth, NJ | 0.000 | 0.160 | Jan 2016 | 0.650 | Jan 2017 | 0.670 | Jan 2018 | - | | 0.670 | 0.000 | 1.480 | - |
| GCCS TCO | C/CPFF | CECOM/MITRE : Ft. Monmouth, NJ | 0.000 | 0.106 | Jan 2017 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.106 | - |
| Prior Years Cumulative Funding | Various | Various : Various | 3.185 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.185 | - |
| | | **Subtotal** | 8.437 | 1.266 | | 1.925 | | 1.970 | | - | | 1.970 | - | - | - |

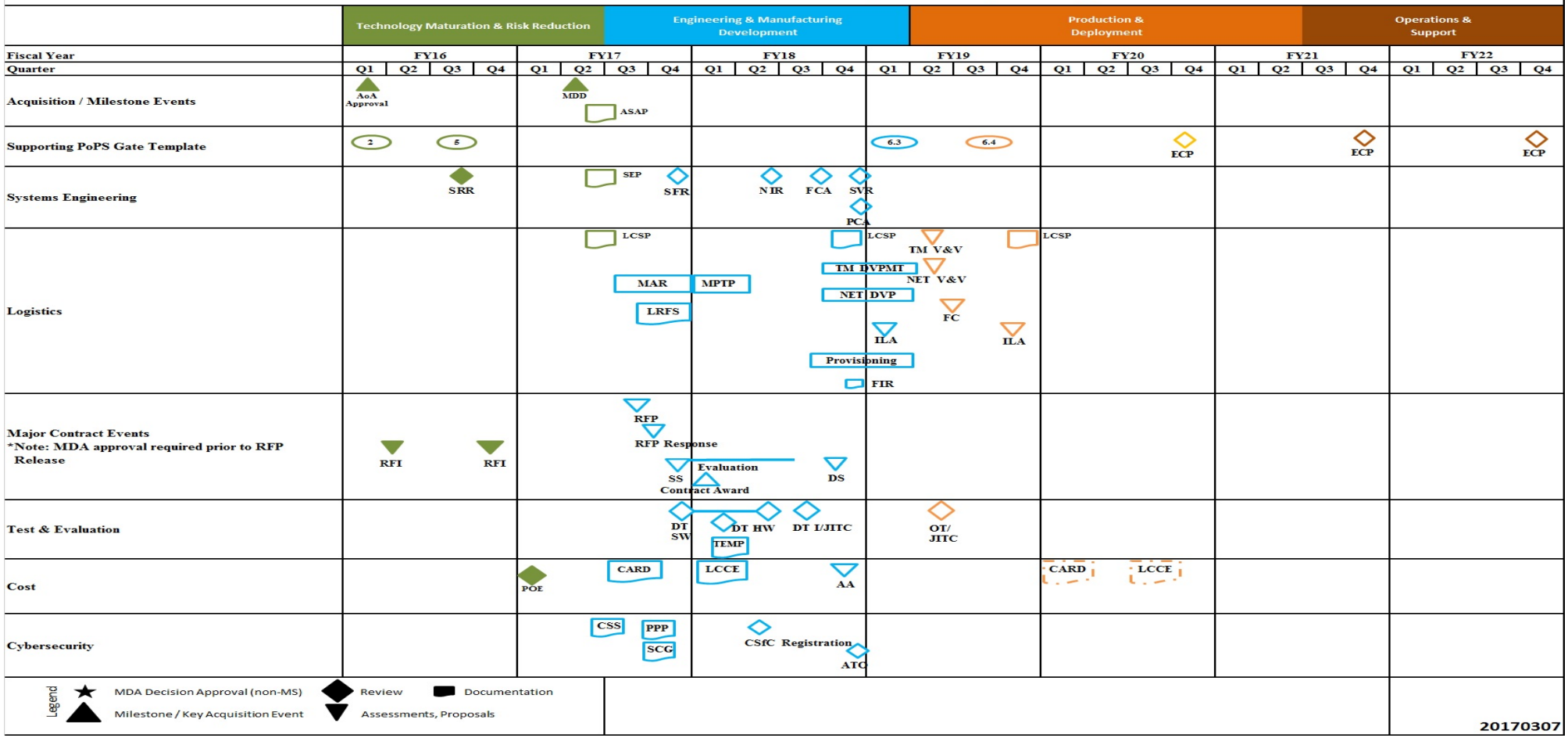
| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 248.364 | 21.436 | | 25.381 | | 27.484 | | - | | 27.484 | - | - | - |

**Remarks**

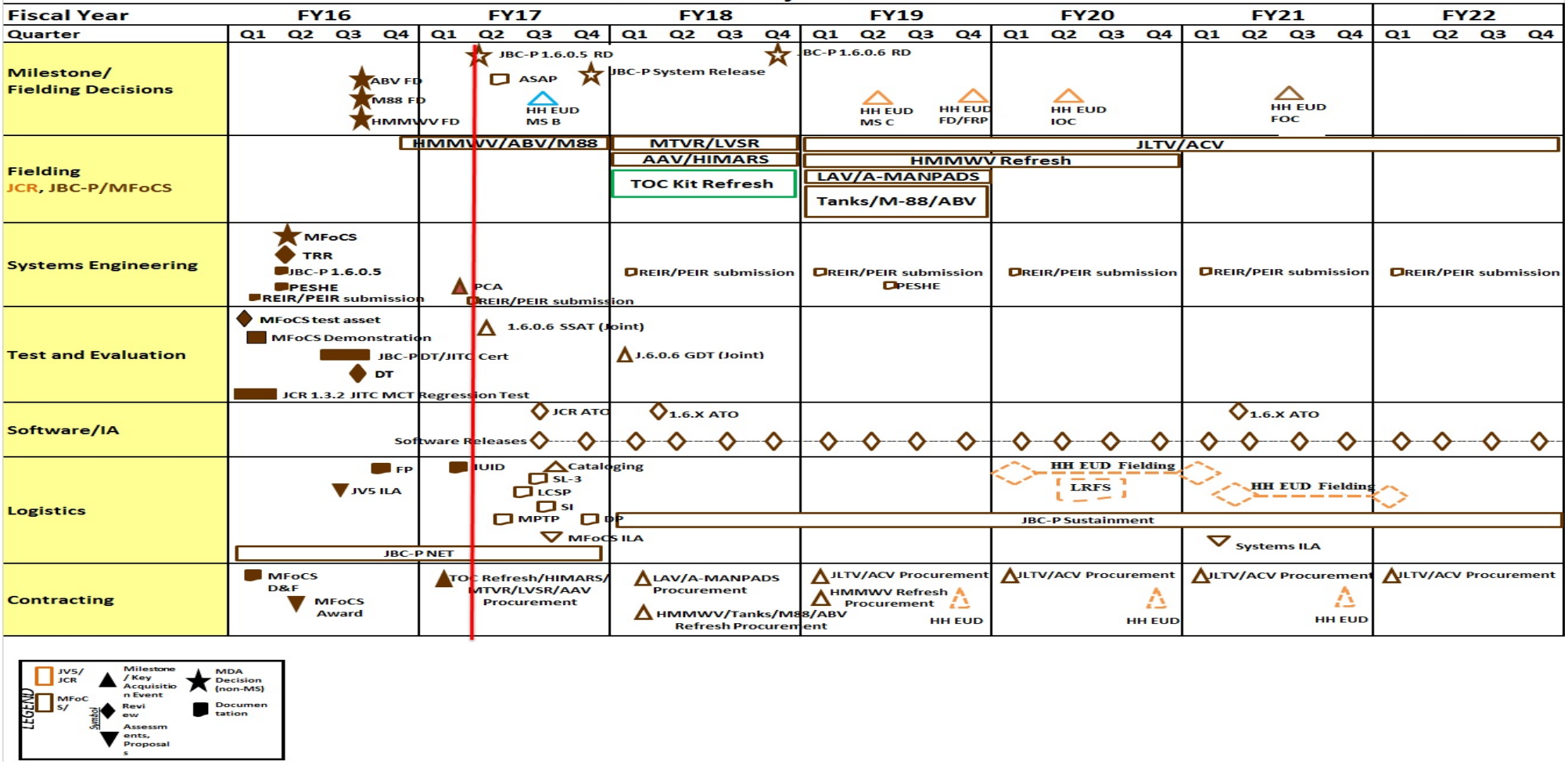
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

# Handheld Command and Control (H2C2) Program Schedule



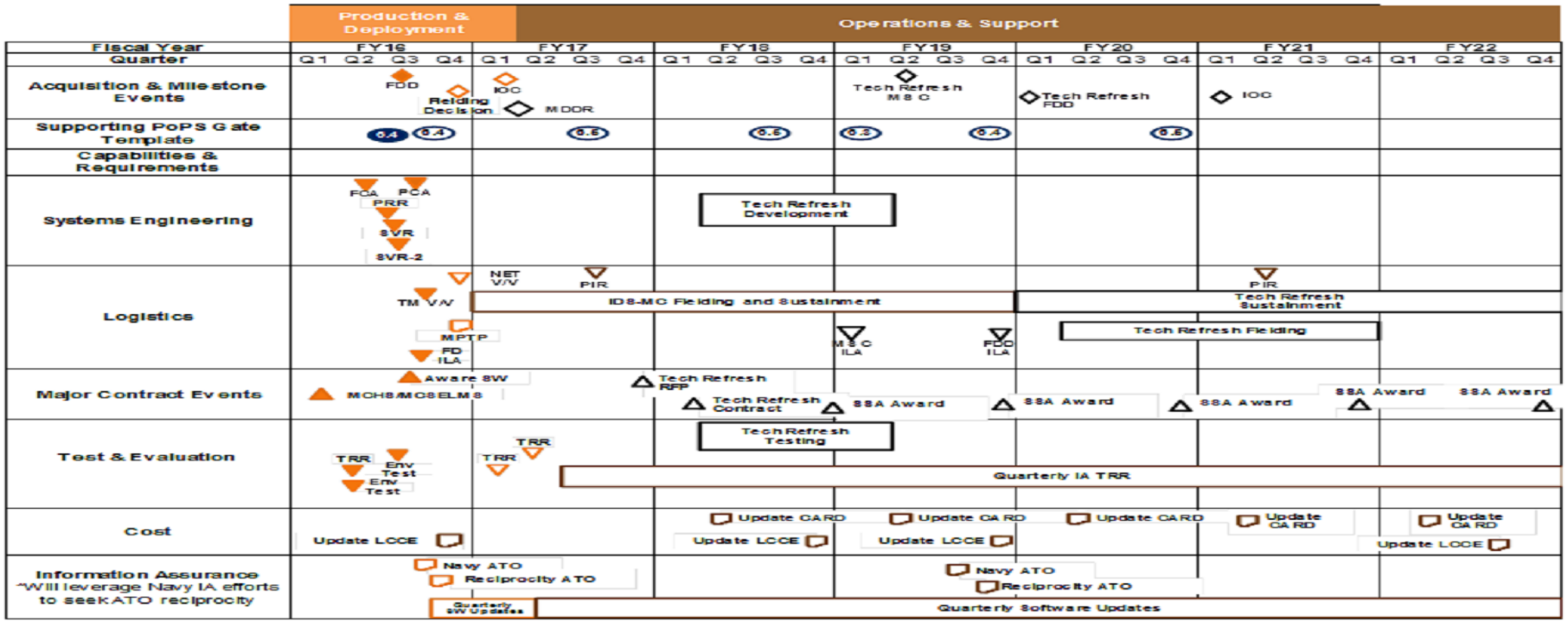
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

## JBC-P FoS Project Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

# Identity Dominance System (IDS) Program Schedule

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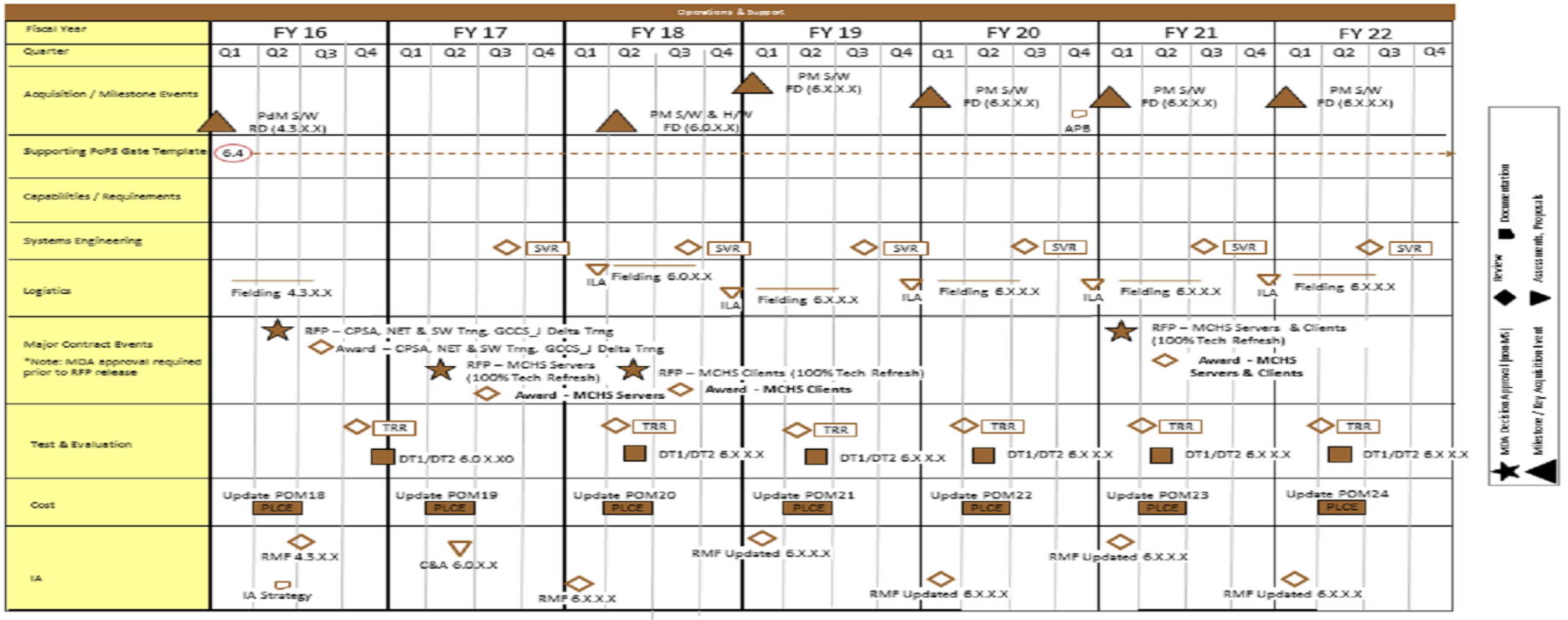
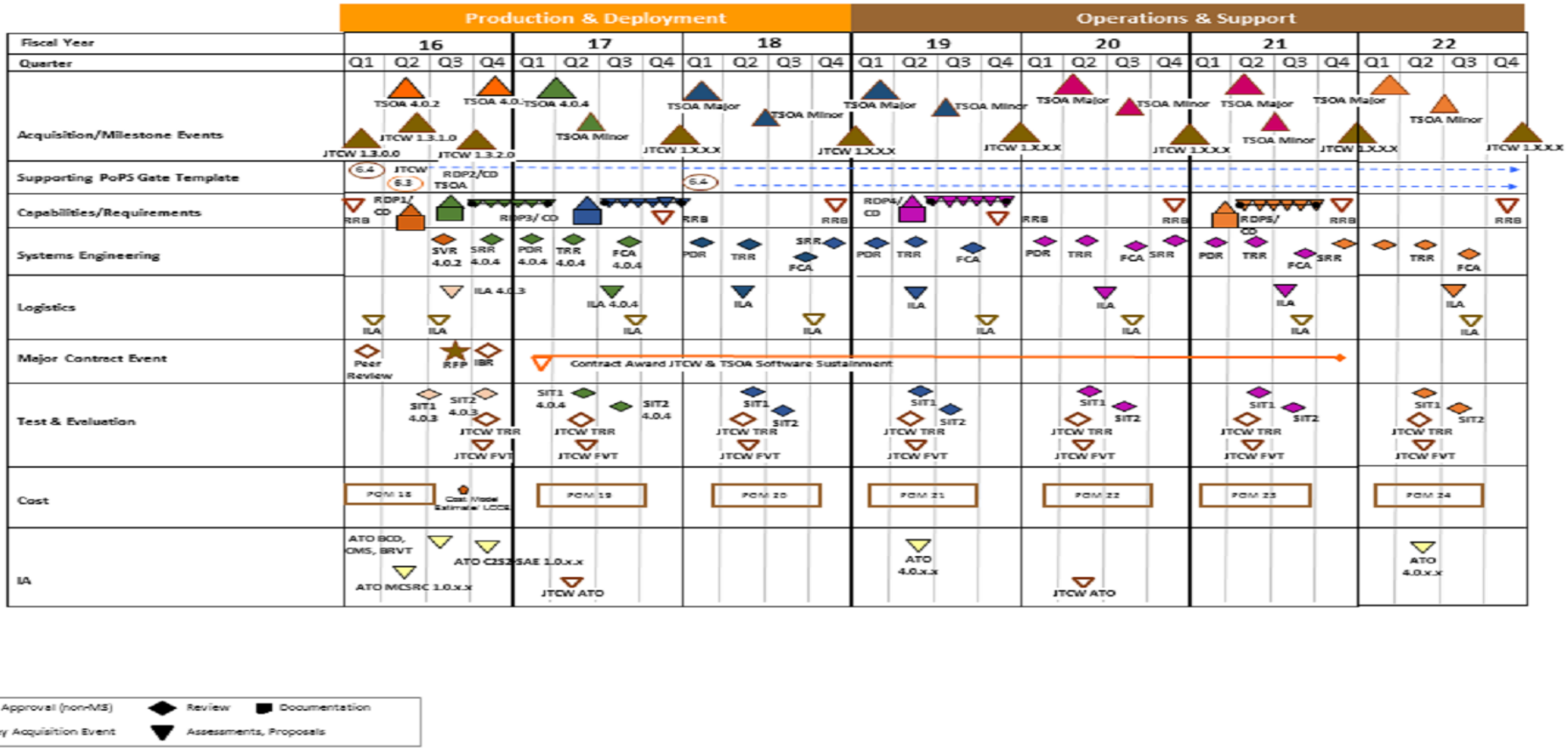
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

## GCCS-TCO SCHEDULE

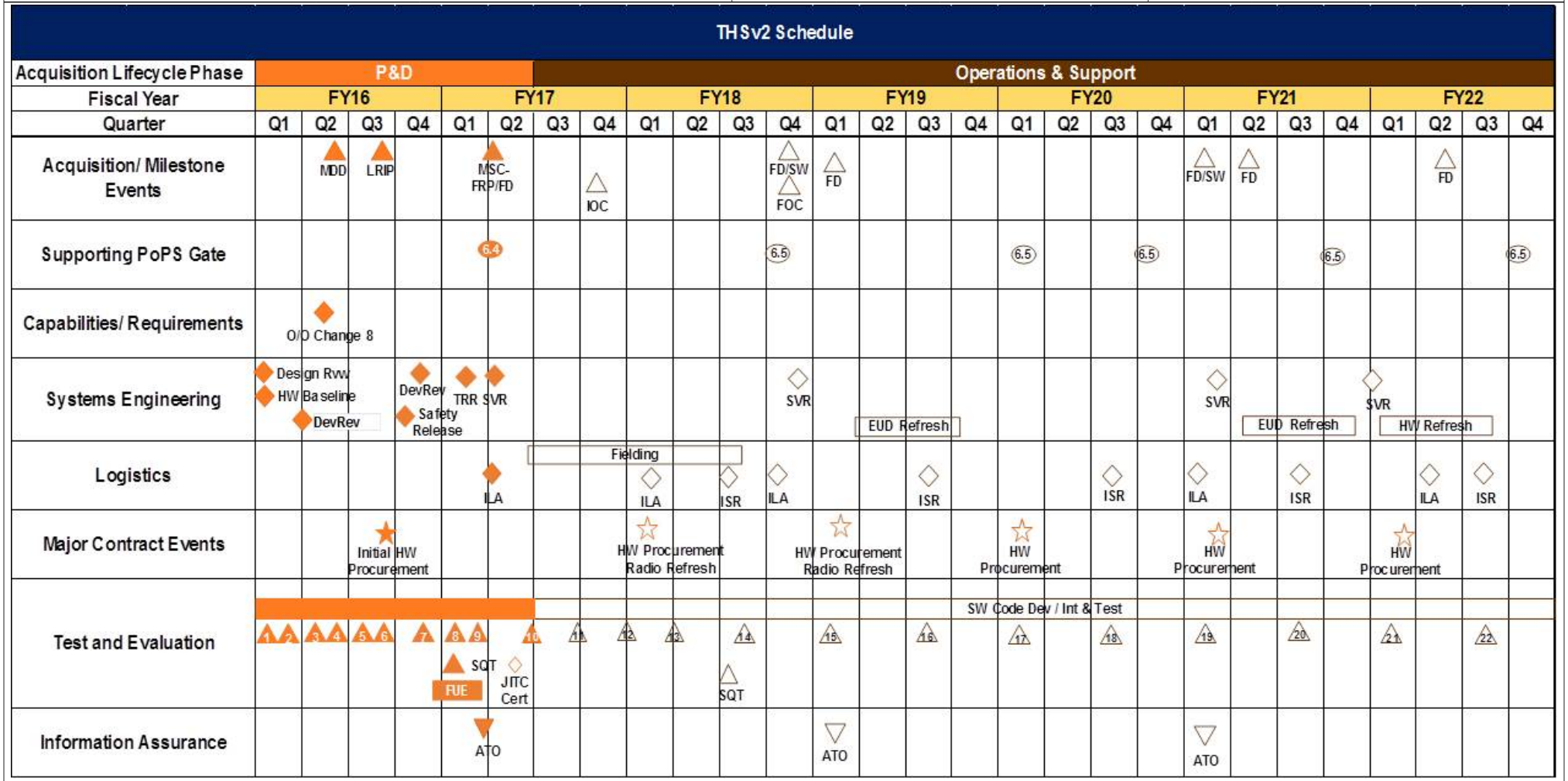


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

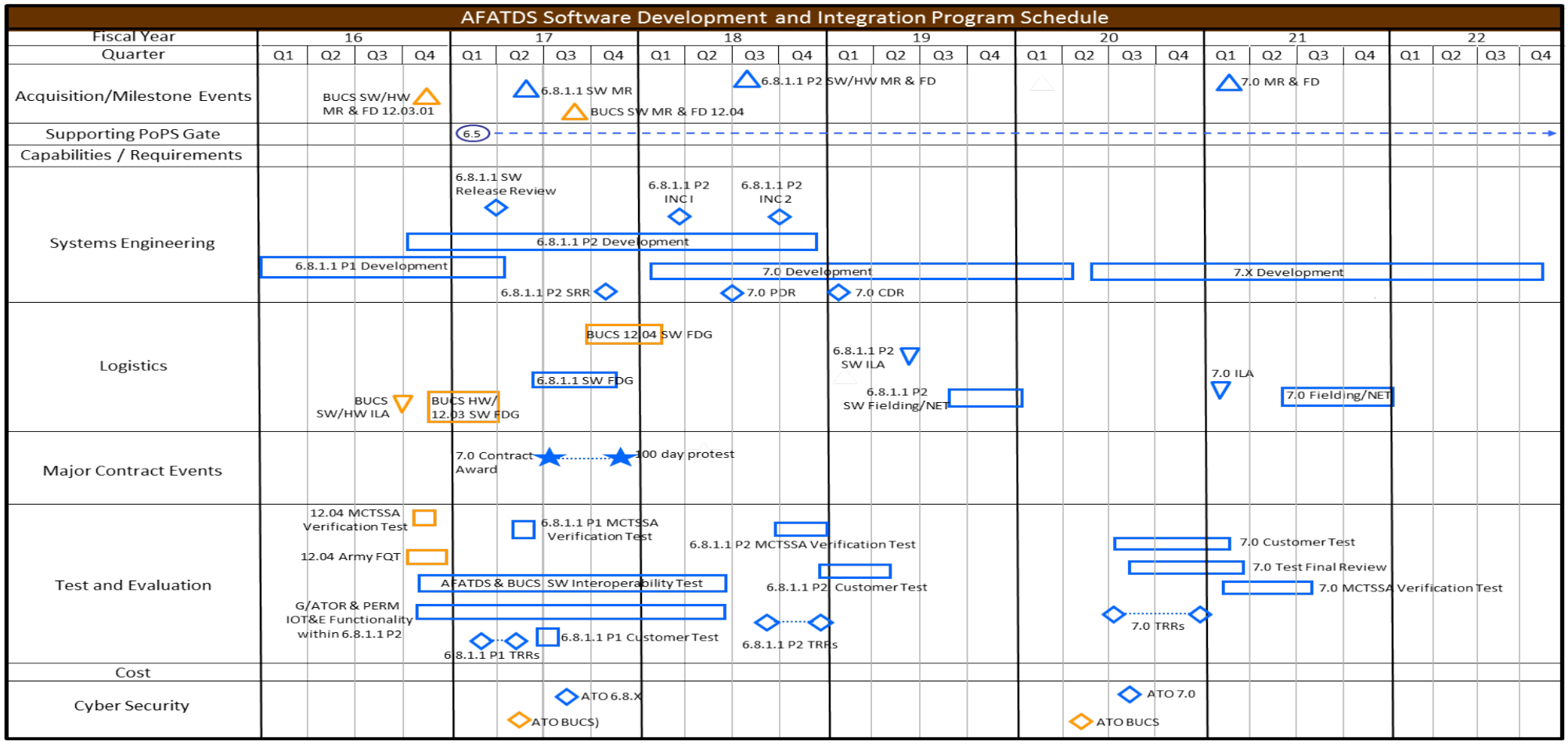
## MAGTF C2 Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2270 / *Exp Indirect Fire Gen Supt Wpn Sys* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2270*** | | | | |
| MAGTF C2 Contract Award Software Sustainment | 1 | 2017 | 1 | 2017 |
| MAGTF C2 SIT 1 | 2 | 2018 | 2 | 2018 |
| MAGTF C2 SIT 2 | 3 | 2018 | 3 | 2018 |
| GCCS-TCO RFP | 2 | 2017 | 2 | 2017 |
| GCCS TCO MCHS Servers Award | 3 | 2017 | 3 | 2017 |
| GCCS-TCO PM S/W & H/W FD (6.0.X.X) | 2 | 2018 | 2 | 2018 |
| GCCS TCO MCHS Clients Award | 3 | 2018 | 3 | 2018 |
| AFATDS 7.0 Software Development | 1 | 2018 | 2 | 2020 |
| AFATDS 7.0 Testing | 3 | 2020 | 3 | 2021 |
| THS - THS V2 Milestone C | 2 | 2017 | 2 | 2017 |
| JBC-P FoS Platform Fielding - MTVR, LVSR | 1 | 2018 | 4 | 2018 |
| JBC-P FoS Platform Fielding - AAV, HIMARS | 1 | 2018 | 4 | 2018 |
| JBC-P HH EUD MS C | 2 | 2019 | 2 | 2019 |
| JBC-P HH EUD IOC | 2 | 2020 | 2 | 2020 |
| H2C2 DT HW | 1 | 2018 | 1 | 2018 |
| H2C2 OT | 2 | 2019 | 2 | 2019 |
| IDS-MC Increment 1 FDD | 3 | 2016 | 3 | 2016 |
| IDS-MC Increment 1 Fielding Decision | 4 | 2016 | 4 | 2016 |
| IDS-MC Initial Operational Capability (IOC) | 1 | 2017 | 1 | 2017 |
| IDS-MC Tech Refresh Development | 2 | 2018 | 2 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2273 / *Air Ops Cmd & Control (C2) Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2273: *Air Ops Cmd & Control (C2) Sys* | 413.245 | 10.969 | 13.219 | 14.630 | - | 14.630 | 11.423 | 10.965 | 11.240 | 11.463 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

Funding for the Common Aviation Command and Control System (CAC2S) program was moved to PE 0206335M Common Aviation Command and Control System (CAC2S), Project 3373 beginning in FY15. Prior Year funding is located in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Ops Cmd & Control (C2) Systems.

**A. Mission Description and Budget Item Justification**

Combat Operations Center (COC) - AN/TSQ-239 (V)1-4 are a deployable, self-contained, modular, centralized and scalable facility ((V)1 MEF-size, (V)2 MSC/Div-size, (V)3 Regiment-size, (V)4 Battalion-size) which provides digital, shared Command and Control/Situational Awareness functionalities to enhance the Common Operational Picture (COP) for the Command Element, Ground Command Element, Air Combat Element, and Logistics Combat Element. It is a commercial-off-the-shelf integrated hardware solution using unit provided radios, re-hosted tactical data systems, and available Marine Corps prime movers to transport the system. Funds support testing and Information Assurance (IA) certification activities, integration of emerging technology, and On The Move (OTM) capabilities. The increase of $0.807M from FY17 to FY18 will fund market research for hardware refresh beginning in FY18.

Composite Tracking Network (CTN) - Provides a ground based sensor netting solution that significantly improves situational awareness by correlating sensor measurement data (target position, speed, heading, Identification Friend and Foe (IFF), etc.) from local and remote radars in the Cooperative Engagement Capability (CEC) network. This data is then provided to the warfighter in the form of composite, real-time, air surveillance tracks to the Marine Air Command and Control node and is integral in providing an accurate representation of the airspace to reduce ground to air and air to air fratricide, facilitate more effective integration of air and surface fires, extend the air defensive capability of the Naval force in the littorals and enable integrated fire control (IFC) for the Marine Corps. The decrease of $3.697M from FY17 to FY18 is due to fully funding Common Array Block - Expeditionary (CAB-E) antenna integration into the CTN system in FY17.

Remote Video Viewing Terminal (RVVT) - Consists of Commercial Off-The-Shelf (COTS) Video Down-Link (VDL) products such as the VideoScout Mobile Configuration 2 (VS-MC/2), VideoScout Mobile Configuration 3 (VS-MC/3), Man Portable Video Down-Link (MPVDL) that allow for the viewing and exploitation of Full Motion Video (FMV) from Intelligence, Surveillance and Reconnaissance (ISR) assets. VDL systems are mission critical for coordination of direct and indirect fires and the prevention of fratricide. These systems provide the warfighter with video and metadata from all USMC manned and unmanned aircraft to include but not limited to Raven B, Puma, Micro-UAS, Shadow, Predator, Fire Scout, and Litening Pod on P-3, AV8-B, and F/A-18. Data is displayed to Forward Observers (FO), Joint Fires Observers (JFO), Joint Terminal Attack Coordinators (JTAC), and Forward Air Controller (FAC).

Theater Battle Management Core System (TBMCS) - Joint mandated Air War planning tool for the generation, dissemination and execution of the Air Tasking Order (ATO). TBMCS is an Air Force led program, which provides the automated tools necessary to manage tactical air operations, execute area air defense and airspace

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

management in the tactical area of operation, and coordinate operations with components of other military services. TBMCS is located at the Tactical Air Command Center (TACC), with remotes located throughout the area of operation. It is scalable, allowing for joint, coalition and service specific operations. It is an evolutionary acquisition program. The increase of $3.306M from FY17 to FY18 is due to the initiation of funding in support of Air Force led Command and Control Air Operation System - Command and Control Information Services (C2AOS-C2IS) requirements. USMC is funding participation in the Air Force's test events to ensure USMC requirements are being implemented as C2AOS-C2IS will be the replacement for Air Force TBMCS. C2AOS-C2IS - is an ACAT III, post Milestone B, Air Force led program. C2AOS-C2IS will bring increased capability to the Operating Forces with a modern services based infrastructure and modern applications. C2AOS-C2IS provides additional tools to conduct: Situational Awareness and Assessment; Airspace De-confliction; Execution Management and Re-planning; Close Air Support; Targeting/Weaponeering; and Time Critical Targeting. Software development and sustainment keeps Marine Aviation relevant and operational in a joint theater. USMC risk reduction efforts include conducting Critical Analysis/Map Abstraction Layer implementation and assessment and Risk Reduction Testing.

The Marine Air Command and Control System (MACCS) Sustainment - Consists of various command and control agencies designed to provide the Aviation Combat Element (ACE) commander with the ability to monitor, supervise and influence the application of Marine aviation assets in support of Air/Ground operations. The MACCS Sustainment provides funding to keep these fielded systems ready, relevant and capable until their functions are replaced by the Common Aviation Command and Control System (CAC2S). MACCS RDT&E funding is not required after FY15 and is no longer included in Project Element 0206313M beginning in FY16.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** COC: Continued Capability Solution | 0.584 | 1.920 | 4.446 | 0.000 | 4.446 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Initiated market research, test and software integration efforts needed to align with other C2 systems.<br>***FY 2017 Plans:***<br>-Continue testing and software integration efforts needed to align with other C2 systems.<br>-Initiate market research in anticipation of hardware refresh beginning in FY18.<br>***FY 2018 Base Plans:***<br>-Continue testing and software integration efforts needed to align with other C2 systems.<br>-Complete market research for hardware refresh.<br>-Increase of $2.526 from FY17 to FY18 for testing and software integration efforts to address end-of-life obsolescence issues and alignment with other C2 systems.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** COC: Management Services | 0.853 | 2.636 | 0.917 | 0.000 | 0.917 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>-Initiated engineering support for system optimization and system enhancements<br>***FY 2017 Plans:***<br>-Continue engineering support for system optimization and system enhancements.<br>***FY 2018 Base Plans:***<br>-Continue engineering support for system optimization and system enhancements.<br>-Decrease of $1.719 from FY17 to FY18 due to reduced FFRDC engineering support.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Composite Tracking Network (CTN): Support and Management Services | 0.458 | 0.746 | 0.262 | 0.000 | 0.262 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued Software Maintenance Support and Certification.<br>- Continued Data Collection and Analysis.<br>- Continued systems engineering and updates to the software baseline.<br>- Continued travel, engineering support, and test support.<br>***FY 2017 Plans:***<br>- Continue Software Maintenance Support and Certification.<br>- Continue Data Collection and Analysis.<br>- Continue systems engineering and updates to the software baseline.<br>- Continue travel, engineering support, and test support.<br>- Initiate Common Array Block - Expeditionary (CAB-E) support efforts to replace current Compact Solid State Antenna (CSSA) which will be obsolete and unreliable by FY18.<br>***FY 2018 Base Plans:***<br>- Continue systems engineering efforts and updates to the software baseline.<br>- Continue travel, engineering support, and test support.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Composite Tracking Network (CTN): Engineering Development | 4.830 | 1.667 | 1.117 | 0.000 | 1.117 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued CAB-E testing/verification/updates.<br>- Continued to support updates for Accelerated Mid-Term Interoperability Improvement Program (AMIIP).<br>***FY 2017 Plans:***<br>- Continue CAB-E testing/verification/updates.<br>- Continue to support updates for AMIIP.<br>- Complete software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support.<br>- Continue Independent Verification and Validation support as well as Information Assurance (IA) tactical side hardening regression testing.<br>***FY 2018 Base Plans:***<br>- Continue software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support.<br>- Continue Independent Verification and Validation support as well as Information Assurance (IA) tactical side hardening regression testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** RVVT: Preparation | 1.334 | 0.163 | 1.158 | 0.000 | 1.158 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued Analysis of Alternatives (AOA) for family of RVVT systems.<br>***FY 2017 Plans:***<br>- Complete analysis for MC/2 and MC/3 replacement.<br>***FY 2018 Base Plans:***<br>- Continue the development and integration of software to ensure full motion video compatibility across the spectrum of weapons and targeting platforms that receive and transmit the data. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Funding increase of $.995M from FY17 to FY18 supports the integration of encrypted video into handheld targeting and target handoff system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Composite Tracking Network (CTN): Developmental Testing and Cyber Security | 0.150 | 3.427 | 0.764 | 0.000 | 0.764 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued Common Array Block-Expeditionary (CAB-E) antenna testing/verification/updates and developmental activities.<br>- Continued integration and interoperability developmental testing with CAC2S, G/ATOR, and the TPS-59 Mode V.<br>- Continued Information Assurance (IA) developmental activities. | | | | | |
| ***FY 2017 Plans:***<br>- Continue Common Array Block-Expeditionary (CAB-E) antenna testing/verification/updates and developmental activities.<br>- Continue integration and interoperability developmental testing with CAC2S, G/ATOR, and the TPS-59 Mode V.<br>- Continue Information Assurance (IA) developmental activities.<br>-Initiate efforts to integrate the Common Array Block-Expeditionary (CAB-E) Antenna into the Composite Tracking Network (CTN) system. Efforts include: SDP-S firmware and software updates, performance verification and test of AN/USB-4G system level requirements as well as systems engineering support for the retrofit of a CTN production representative model with a CAB-E Antenna.<br>- Initiate developmental test #1 efforts in support of Common Array Block-Expeditionary (CAB-E) to include associated engineering support. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue integration and interoperability developmental testing with CAC2S, G/ATOR, and the TPS-59 Mode V.<br>- Continue Information Assurance (IA) developmental activities.<br>- Initiate CAB-E Formal Qualification Test (FQT) efforts and Field User Evaluation (FUE) test events.<br>- Initiate CTN Independent Verification and Validation (IV&V) testing to include associated engineering support. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate developmental test #2 efforts in support of Common Array Block-Expeditionary (CAB-E) to include associated engineering support.<br><br>Funding decrease of $2.663M from FY17 to FY18 due to fully funding CAB-E integration into the CTN system in FY17.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** C2AOS-C2IS Product Development<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate efforts to implement and assess tactical map software to interface with C2AOS-C2IS.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 0.445<br>- | 0.000<br>- | 0.445<br>- |
| ***Title:*** C2AOS-C2IS Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate critical analysis efforts with C2AOS-C2IS applications in support of risk reduction testing.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 0.324<br>- | 0.000<br>- | 0.324<br>- |
| ***Title:*** C2AOS-C2IS Test and Evaluation | 0.000 | 0.000 | 1.674 | 0.000 | 1.674 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate information assurance testing on developmental software to determine the cyber security posture and conduct risk reduction testing to identify potential vulnerabilities.<br>- Initiate USMC support of Air Force C2AOS-C2IS Joint Partner testing.<br>- Initiate Regression Testing of tactical map software interface.<br>- Initiate test support efforts to Air Force led Integrated Developmental Test, Integrated Developmental Test Regression Test and Operational Tests.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** C2AOS-C2IS Management Services | 0.000 | 0.000 | 0.546 | 0.000 | 0.546 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate management support efforts to participate in the development of C2AOS-C2IS and Air Force led test events to ensure USMC requirements are addressed.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TBMCS - Software Development Support | 2.760 | 2.660 | 2.977 | 0.000 | 2.977 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued test and evaluation support for TBMCS upgrades for Joint Interoperability.<br>***FY 2017 Plans:***<br>-Continue test and evaluation support for TBMCS upgrades for Joint Interoperability.<br>-Initiate development test and evaluation support of USMC developed software releases which support the software baseline for Cyber Security upgrades as well as Cyber Security Accreditation.<br>-Initiate software integration analysis in preparation for TBMCS to C2AOS-C2IS transition.<br>***FY 2018 Base Plans:***<br>-Continue test and evaluation support for TBMCS upgrades for Joint Interoperability.<br>-Continue development test and evaluation support of USMC developed software releases which support the software baseline for Cyber Security upgrades as well as Cyber Security Accreditation.<br><br>Increase of $0.317M in FY18 is to support cyber security updates required for transition to Risk Management Framework (RMF).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 10.969 | 13.219 | 14.630 | 0.000 | 14.630 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4640CT: *CTN* | 0.810 | 1.515 | 5.360 | - | 5.360 | 5.561 | 3.527 | 0.000 | 0.000 | 0.000 | 67.784 |
| • PMC/4640CU: *MACCS* | 1.922 | 2.855 | 2.662 | - | 2.662 | 0.050 | 0.051 | 0.052 | 0.053 | 0.000 | 99.176 |
| • PMC/4640DX: *TBMCS* | 0.580 | 1.299 | 1.902 | - | 1.902 | 1.477 | 1.478 | 1.485 | 1.520 | Continuing | Continuing |
| • PMC/419000: *COC* | 10.384 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 213.732 |
| • PMC/464023: *RVVT* | 0.231 | 10.248 | 8.469 | - | 8.469 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/463100: *COC* | 0.000 | 9.827 | 10.188 | - | 10.188 | 10.824 | 11.303 | 11.827 | 12.060 | Continuing | Continuing |

**Remarks**

PMC funding for Common Aviation Command and Control (CAC2S) program was moved to PE 0206335M, BLI 4644 CAC2S beginning FY 2015. Prior year funding is located in PE 0206313M, BLI 4640 Air Operations C2 Systems.
PMC funding for Combat Operations Center (COC) program was moved from BLI 4190 to 4631 starting in FY17.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

**D. Acquisition Strategy**

TBMCS - is an ACAT III, Air Force led program with joint interest/oversight. USMC will continue following the Air Force lead when fielding only the joint modules of TBMCS. As USMC unique requirements are identified the USMC will deviate accordingly to sufficiently sustain systems. Over the course of the FYDP, TBMCS is to separately manage the development and fielding of software and hardware engineering change proposals for Information Assurance (IA) and functionality updates to ensure daily direct support of the Air Battle Plan in joint theaters of operation. The Air Force is in the process of transitioning TBMCS to C2AOS-C2IS. C2AOS-C2IS is an ACAT III, Air Force led joint interest program and identified as a viable replacement of TBMCS. C2AOS-C2IS is currently in development by the Air Force with an anticipated Full Deployment Decision (FDD) 4th quarter FY 2018. The USMC C2AOS-C2IS strategy is to support and participate in the Air Force led FY 2018 joint test events, implementation of a tactical map interface, and conduct risk reduction testing in order to ensure the USMC remains aligned with the Air Force mandated testing and fielding schedules.

CTN - The USMC's CTN acquisition strategy is to participate in the USN's Cooperative Engagement Capability (CEC) program procurement and testing, making necessary modifications to support the Marine Corps' requirement. The next major efforts are the development and procurement of the Common Array Block-Expeditionary (CAB-E) Antenna to replace the Composite Solid State Antenna (CSSA), which will become obsolete in FY 2018, and completion of interfaces with Ground/Air Task Oriented Radar (G/ATOR) and CAC2S.

RVVT - The RVVT acquisition strategy is to continually improve the Video Down-Link (VDL) products by enhancing the encryption, range, and reducing the power and weight requirements through competition. Efforts to integrate Full Motion Video (FMV) to support Joint Fires Observers (JFOs) and Joint Terminal Attack Controllers (JTACs) began in FY 2017.

COC - The COC AN/TSQ-239 (V)1-4 is the foundation of USMC C2, meeting near term communications and network requirements across the OpFor. There is a continuing developmental effort to evolve the COC into a fully integrated MAGTF C2 capability. FY 2016 supported continual tech refresh, technology insertion, modernization and software upgrade releases and alignment with associated Command and Control programs as required by OpFor Commanders. FY 2017 and FY 2018 continues to maintain industry standard and interoperability with disparate C2 systems across the joint forces.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | VARIOUS : VARIOUS | 256.411 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 256.411 | - |
| CTN Engineering Devlopment | C/CPFF | NAVSEA PEO IWS : Washington, DC | 14.322 | 4.830 | May 2016 | 3.427 | May 2017 | 1.117 | Feb 2018 | - | | 1.117 | Continuing | Continuing | Continuing |
| COC | WR | NSWC : Dahlgren,VA | 5.430 | 0.254 | Mar 2016 | 0.185 | Feb 2017 | 1.240 | Feb 2018 | - | | 1.240 | 0.000 | 7.109 | - |
| COC | C/CPIF | NSWC : Dahlgren, VA | 0.000 | 0.130 | Jun 2016 | 0.167 | Apr 2017 | 1.706 | Feb 2018 | - | | 1.706 | 0.000 | 2.003 | - |
| COC | WR | SSC-LANT : Charleston, SC | 1.079 | 0.200 | Aug 2016 | 1.285 | Feb 2017 | 1.315 | Feb 2018 | - | | 1.315 | 0.000 | 3.879 | - |
| COC | C/CPIF | SSC-Lant2 : Charleston, SC | 0.000 | 0.000 | | 0.283 | Apr 2017 | 0.185 | Jan 2018 | - | | 0.185 | 0.000 | 0.468 | - |
| RVVT | MIPR | ARDEC : Picatinny, NJ | 0.000 | 1.334 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.334 | - |
| C2AOS-C2IS Tactical Map Software Development | SS/FFP | Raytheon Solypsis : Fulton, MD | 0.000 | 0.000 | | 0.000 | | 0.445 | Dec 2017 | - | | 0.445 | 0.000 | 0.445 | - |
| RVVT | MIPR | AMRDEC : Huntsville, AL | 1.008 | 0.000 | | 0.163 | Mar 2017 | 1.158 | Mar 2018 | - | | 1.158 | 0.000 | 2.329 | - |
| | | **Subtotal** | 278.250 | 6.748 | | 5.510 | | 7.166 | | - | | 7.166 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | VARIOUS : VARIOUS | 46.207 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 46.207 | - |
| CTN Engineering Support | WR | NSWC : Dahlgren, VA | 5.357 | 0.231 | Jan 2016 | 0.682 | Jan 2017 | 0.215 | Jan 2018 | - | | 0.215 | Continuing | Continuing | Continuing |
| CTN Engineering Support | WR | NSWC : PHD, CA | 0.515 | 0.054 | Feb 2016 | 0.040 | Feb 2017 | 0.033 | Feb 2018 | - | | 0.033 | Continuing | Continuing | Continuing |
| CTN Engineering Support | WR | NSWC : Crane, IN | 1.201 | 0.150 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.351 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2273 / *Air Ops Cmd & Control (C2) Sys* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTN Engineering Support | Various | Travel-TAD : Not Specified | 1.077 | 0.023 | Sep 2016 | 0.024 | Sep 2017 | 0.014 | Sep 2018 | - | | 0.014 | Continuing | Continuing | Continuing |
| C2AOS-C2IS Engineering Support | WR | NSWC Dahlgren : Dahlgren, VA | 0.000 | 0.000 | | 0.000 | | 0.324 | Dec 2017 | - | | 0.324 | 0.000 | 0.324 | - |
| | | **Subtotal** | 54.357 | 0.458 | | 0.746 | | 0.586 | | - | | 0.586 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | VARIOUS : VARIOUS | 37.693 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 37.693 | - |
| TBMCS Software Development | C/FFP | Lockheed Martin : Colorado Springs, CO | 6.985 | 2.543 | Mar 2016 | 2.660 | Mar 2017 | 2.977 | Mar 2018 | - | | 2.977 | Continuing | Continuing | Continuing |
| TBMCS Software Development | MIPR | Englin AFB : Englin AFB, FL | 0.846 | 0.217 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| CTN Developmental Testing | WR | NSWC Corona : Corona, CA | 1.557 | 0.000 | | 0.333 | Feb 2017 | 0.325 | Feb 2018 | - | | 0.325 | 0.000 | 2.215 | - |
| CTN Developmental Testing | WR | NSWC DD : Dahlgren, VA | 1.321 | 0.150 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.471 | - |
| CTN Engineering/Cyber Security Development | C/CPFF | NAVSEA PEO IWS : Washington DC | 0.333 | 0.000 | | 1.334 | Jan 2017 | 0.439 | Jan 2018 | - | | 0.439 | 0.000 | 2.106 | - |
| C2AOS-C2IS Operational Test Support | WR | MCOTEA : Quantico, VA | 0.000 | 0.000 | | 0.000 | | 0.939 | Dec 2017 | - | | 0.939 | 0.000 | 0.939 | - |
| C2AOS-C2IS Developmental Test Support | C/FFP | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.315 | Jan 2018 | - | | 0.315 | 0.000 | 0.315 | - |
| C2AOS-C2IS Cyber Security Training | MIPR | NSWC Dahlgren : Dahlgren, VA | 0.000 | 0.000 | | 0.000 | | 0.420 | Dec 2017 | - | | 0.420 | 0.000 | 0.420 | - |
| | | **Subtotal** | 48.735 | 2.910 | | 4.327 | | 5.415 | | - | | 5.415 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

TBMCS Lockheed Martin software development contract increases in FY 2018 to support the development of additional information assurance controls required to maintain the cyber security posture in preparation for the transition to Risk Management Framework, in accordance with DoD Instruction 8510.01.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | VARIOUS : VARIOUS | 28.671 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 28.671 | - |
| COC Engineering Support | FFRDC | U.S. Army, MITRE : Stafford, VA | 3.232 | 0.853 | Mar 2016 | 2.636 | Jun 2017 | 0.917 | Mar 2018 | - | | 0.917 | 0.000 | 7.638 | - |
| C2AOS-C2IS Program Support | C/FFP | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.546 | Dec 2017 | - | | 0.546 | 0.000 | 0.546 | - |
| | | **Subtotal** | 31.903 | 0.853 | | 2.636 | | 1.463 | | - | | 1.463 | 0.000 | 36.855 | - |

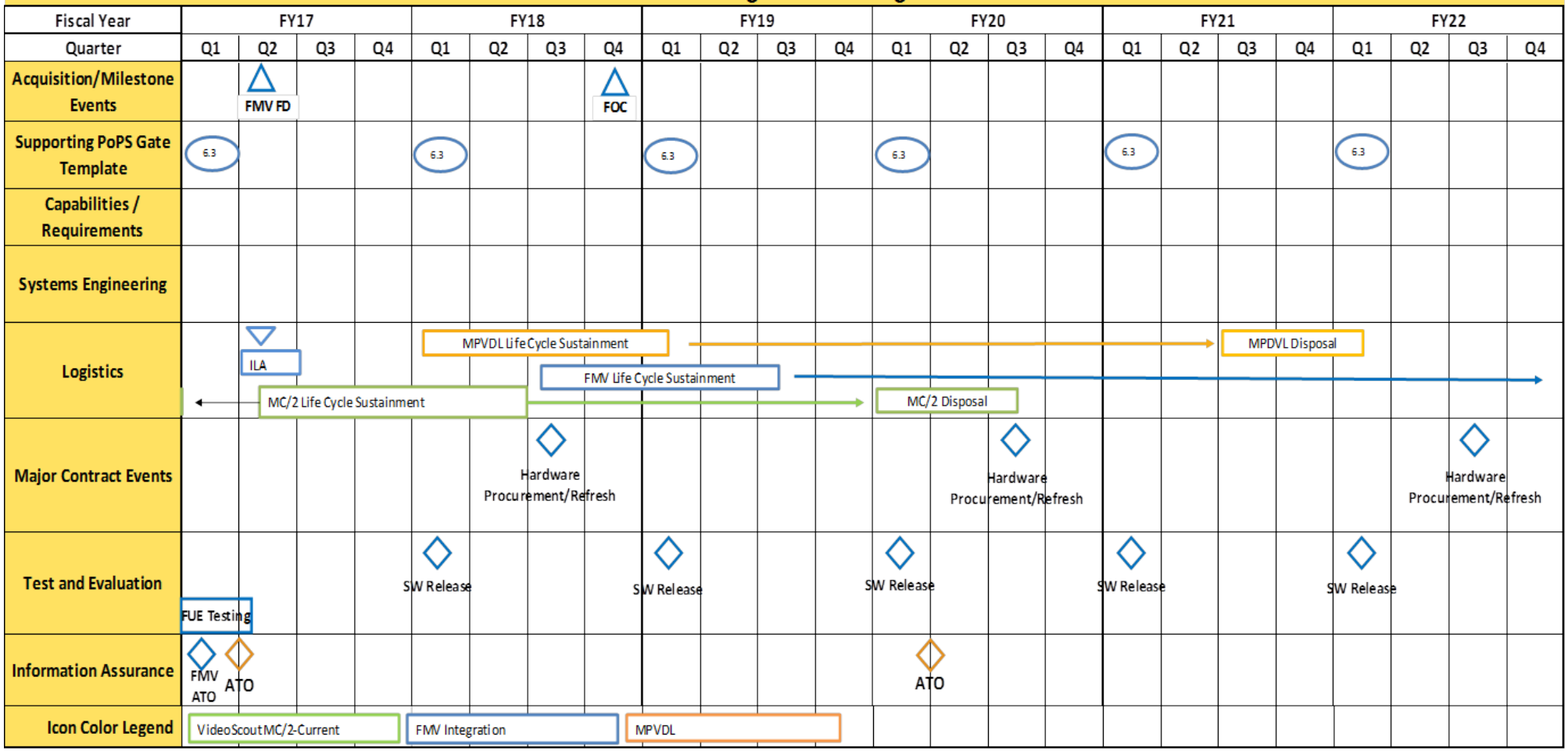
| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 413.245 | 10.969 | | 13.219 | | 14.630 | | - | | 14.630 | - | - | - |

**Remarks**

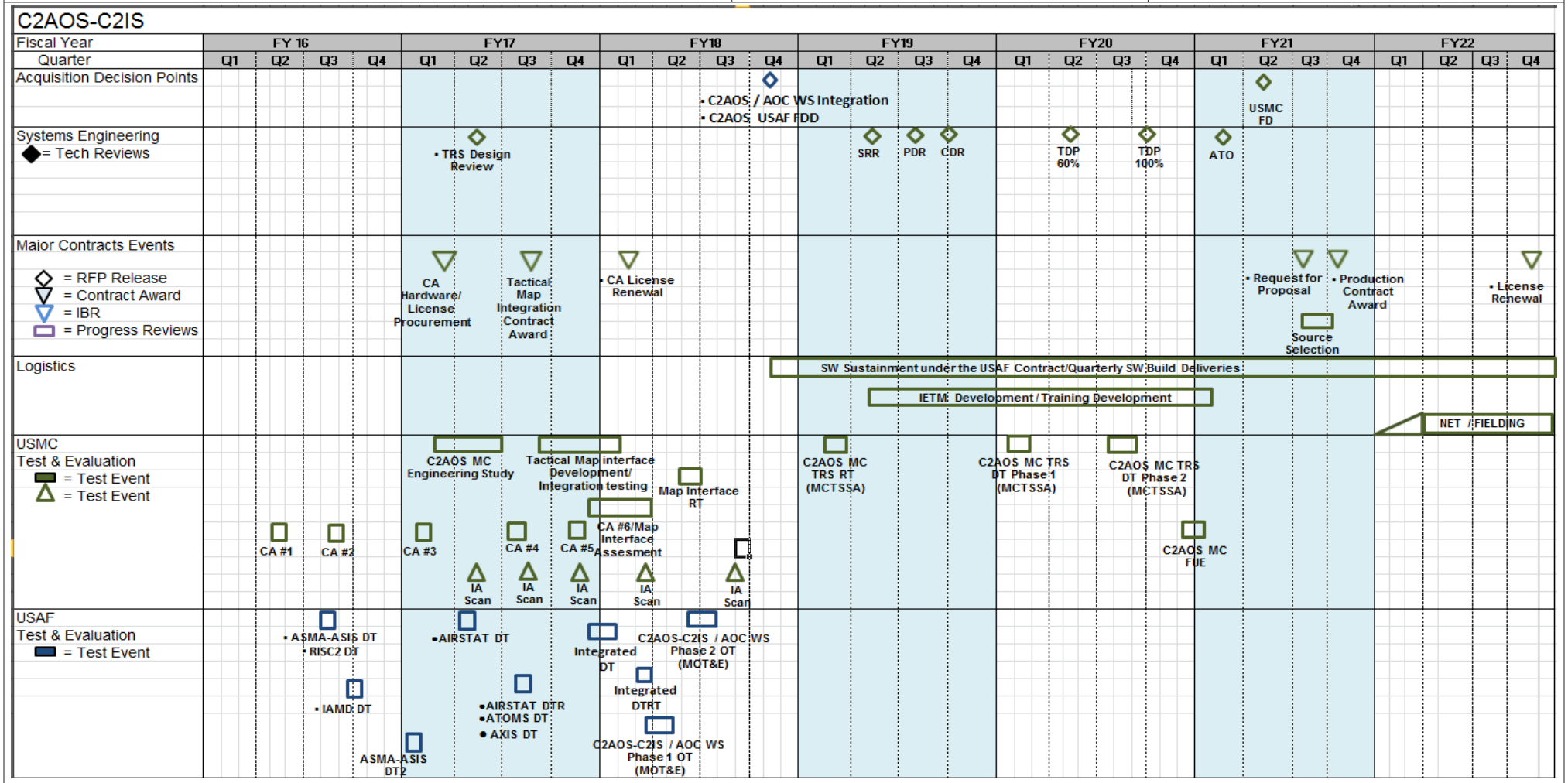
The increase from FY17 to FY18 is due to the initiation of funding in support of Command and Control Air Operation System - Command and Control Information Services (C2AOS-C2IS) requirements.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

## Remote Video Viewing Terminal Program Schedule

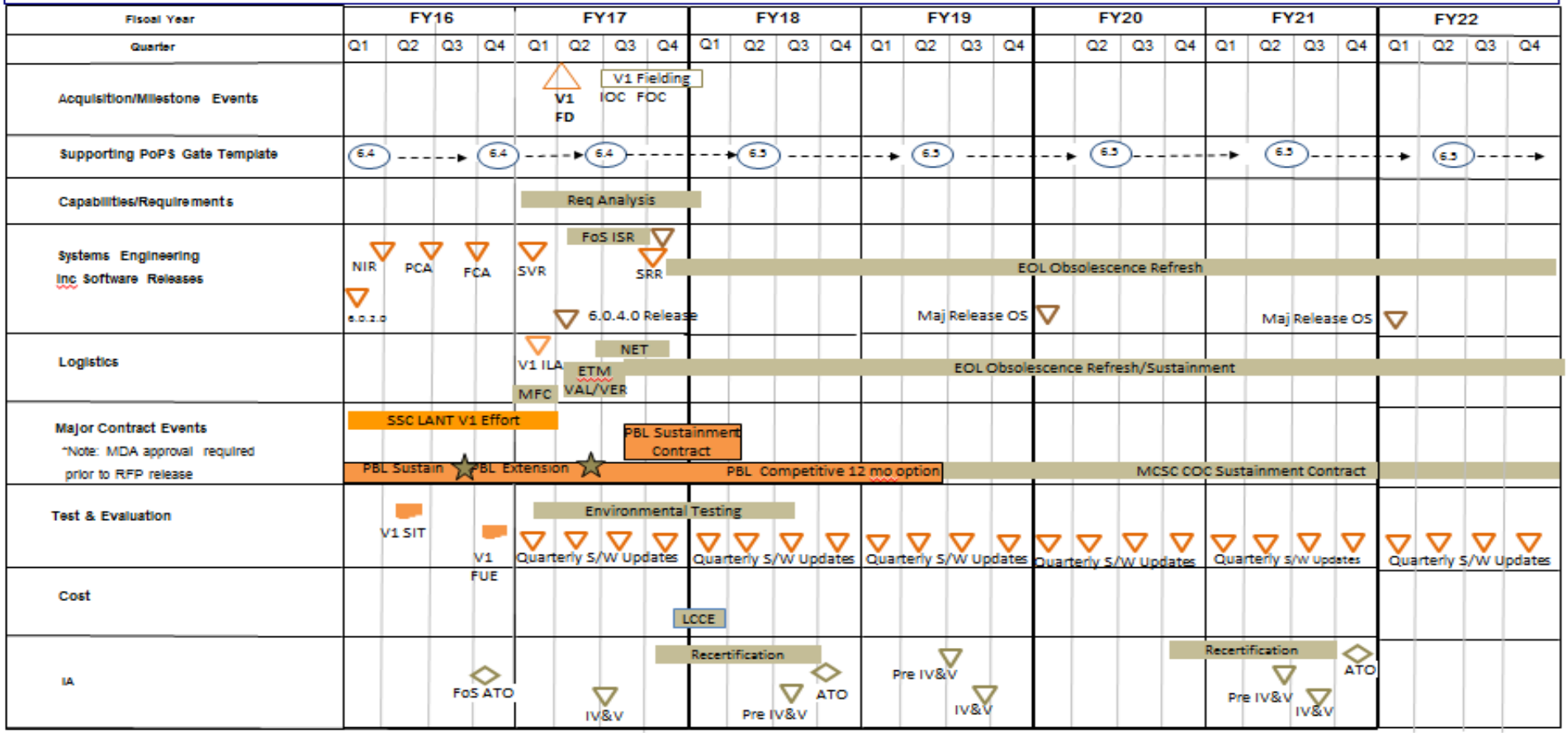


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

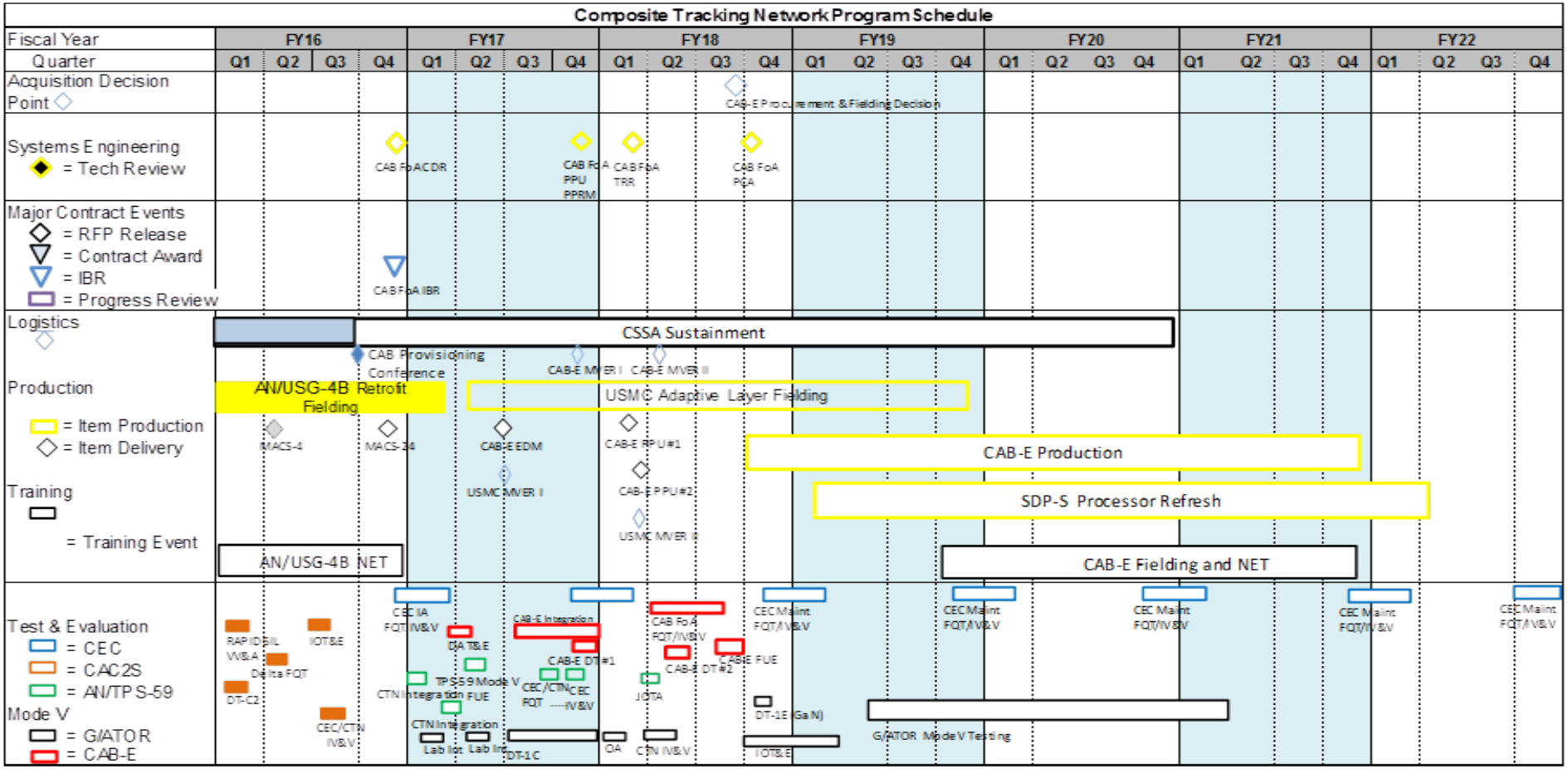


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

# Combat Operations Center (COC) Program Schedule

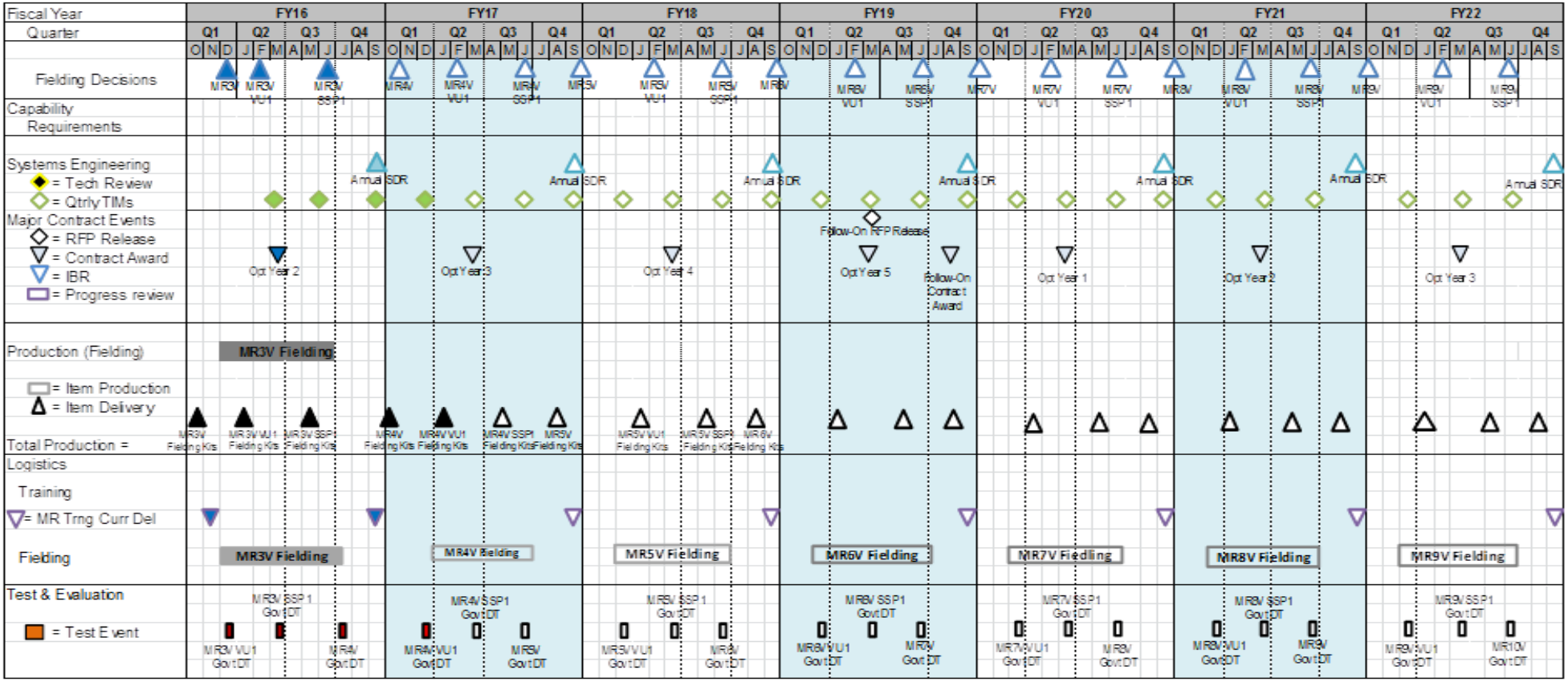


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

## TBMCS Program Schedule



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2273*** | | | | |
| TBMCS MR4V Fielding Decision | 1 | 2017 | 1 | 2017 |
| TBMCS MR4V Fielding | 2 | 2017 | 4 | 2017 |
| TBMCS Option Year 3 Software Development Award | 2 | 2017 | 2 | 2017 |
| TBMSC Annual System Design Review | 4 | 2017 | 4 | 2017 |
| TBMCS MR5V Fielding Decision | 1 | 2018 | 1 | 2018 |
| TBMCS MR4V Fielding Kits (PMC 4640) | 1 | 2017 | 1 | 2017 |
| TBMCS MR5V Fielding Kits (PMC 4640) | 4 | 2017 | 4 | 2017 |
| TBMCS MR5V Fielding | 1 | 2018 | 3 | 2018 |
| TBMCS Option Year 4 Software Development Award | 2 | 2018 | 2 | 2018 |
| TBMCS Government Developmental Test | 3 | 2018 | 3 | 2018 |
| TBMCS Annual System Design Review | 4 | 2018 | 4 | 2018 |
| CTN Integration Event with G/ATOR | 1 | 2017 | 1 | 2017 |
| CTN - AN/TPS 59 Mode V Field User Evaluation (FUE) | 2 | 2017 | 2 | 2017 |
| CTN - CAB-E Integration | 3 | 2017 | 1 | 2018 |
| CTN - DT-1C G/ATOR | 3 | 2017 | 4 | 2017 |
| CTN - CAB-E Developmental Test #1 | 4 | 2017 | 4 | 2017 |
| CTN - CAB-E Developmental Test #2 | 2 | 2018 | 2 | 2018 |
| CTN - Independent Verification and Validation (IV&V) Test | 2 | 2018 | 2 | 2018 |
| CTN - CAB-E Procurement and Fielding Decision (PMC 4640) | 3 | 2018 | 3 | 2018 |
| CTN - CAB-E Field User Evaluation (FUE) | 3 | 2018 | 3 | 2018 |
| RVVT Fielding Decision (FD) | 2 | 2017 | 2 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2273 / *Air Ops Cmd & Control (C2) Sys* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| RVVT Full Operational Capability (FOC) | 4 | 2018 | 4 | 2018 |
| COC V1 Fielding Decision | 2 | 2017 | 2 | 2017 |
| COC V1 IOC | 3 | 2017 | 3 | 2017 |
| COC V1 FOC | 3 | 2017 | 3 | 2017 |
| COC Req Analysis | 1 | 2017 | 1 | 2018 |
| C2AOS-C2IS Engineering Study | 1 | 2017 | 2 | 2017 |
| C2AOS-C2IS Tactical Map Interface Development/Integration Testing | 3 | 2017 | 1 | 2018 |
| C2AOS-C2IS Tactical Map Interface Assessment | 4 | 2017 | 2 | 2018 |
| C2AOS-C2IS Air Force Developmental/Regression Test | 1 | 2018 | 1 | 2018 |
| C2AOS-C2IS Information Assurance Testing | 1 | 2018 | 1 | 2018 |
| C2AOS-C2IS Regression Testing of Tactical Map Interface | 2 | 2018 | 2 | 2018 |
| C2AOS-C2IS - USAF Full Deployment Decision (FDD) | 4 | 2018 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2274 / *Command & Control Warfare Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2274: *Command & Control Warfare Sys* | 32.950 | 8.533 | 6.531 | 8.129 | - | 8.129 | 8.233 | 7.054 | 7.214 | 7.358 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW) SYSTEMS are vehicle mounted and dismounted modular programmable multi-band radio frequency jammers designed to deny enemy use of selected portions of the radio frequency spectrum in the vicinity of the jammer to counter the RCIED threat. The mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs. Legacy CREW systems are currently deployed to meet threats in the multiple theaters of operation and fielded to selected Marine Expeditionary Units (MEU)/Marine Expeditionary Forces (MEF) in support of worldwide deployment. To continue to support the various worldwide missions, each CREW unit receives customized programming (loadsets) to counter that area's RCIED threats. The testing, programming development, and product improvement research are funded with the CREW's RDTE,N funding and prioritized to meet the growing demand for all deployed Marine units.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** *USMC CREW - Product Development | 1.335 | 1.932 | 1.416 | 0.000 | 1.416 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The increase of $1.598M from FY17 to FY18 in the overall CREW program reflects increased test and evaluation supporting mounted CREW development efforts. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Continued the development of software waveform loadsets for USMC CREW Systems including mounted and dismounted system's waveforms used specifically to counter IED threat worldwide.<br>-Continued software waveform loadsets for Universal Test Sets (UTS) across multiple deployment theaters.<br>-Continued development of additional software improvements to overcome selected CREW capability issues not limited by technology obsolescence.<br>-Continued to develop vehicle installation kits for the CREW mounted systems in order to support the integration and installation of the upgrade kits into Marine Corps vehicle platform.<br>-Continued system level verification testing on the Modi II systems to counter RCIED threats. | | | | | |
| ***FY 2017 Plans:***<br>-Continue the development of software waveform loadsets for USMC CREW Systems including mounted and dismounted system's waveforms used specifically to counter IED threat worldwide. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2274 / *Command & Control Warfare Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue software waveform loadsets for Universal Test Sets (UTS) across multiple deployment theaters.<br>-Continue development of additional software improvements to overcome selected Thor III capability issues not limited by technology obsolescence.<br>-Continue to develop vehicle installation kits for the CREW mounted systems in order to support the integration and installation of the upgrade kits into Marine Corps vehicle platform.<br>-Continue system level verification testing on the Modi II system to counter RCIED threats.<br>***FY 2018 Base Plans:***<br>-Continue development of software waveform loadsets for USMC CREW Systems including mounted and dismounted system's waveforms used specifically to counter IED threat worldwide.<br>-Continue software waveform loadsets for Universal Test Sets (UTS) across multiple deployment theaters.<br>-Continue testing and technique development of additional software threatloads to overcome capability issues impacting dismounted Marines and each vehicle platform type.<br>-Continue contracting efforts to update the CREW CVRJ Augmentation Program (CAP) to deliver a system capable of performing against the product specification.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *USMC CREW - Support | 0.311 | 0.649 | 0.722 | 0.000 | 0.722 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued to conduct systems engineering and integration support required for the mounted CREW into Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) mission profiles by developing vehicle installation kits for these mounted units.<br>-Continued system support for CVRJ (V)2, Thor III, Modi II, and Universal Test Sets by analyzing CREW performance impacts resulting from compatibility and environmental risk impacts.<br>***FY 2017 Plans:***<br>-Continue to conduct systems engineering and integration support required for the mounted CREW into Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) mission profiles by developing vehicle installation kits for these mounted units. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2274 / *Command & Control Warfare Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue system support for CVRJ (V)2, Thor III, Modi II, and Universal Test Sets by analyzing CREW performance impacts resulting from compatibility and environmental risk impacts.<br>***FY 2018 Base Plans:***<br>-Continue to conduct systems engineering support for the CREW family of systems and integration support required for the mounted CREW into Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) mission profiles by developing vehicle installation kits for these mounted units.<br>-Continue system support for CVRJ (V)2, Thor III, Modi II, and Universal Test Sets by analyzing CREW performance impacts resulting from compatibility and environmental risk impacts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *USMC CREW - Test and Evaluation | 3.478 | 0.261 | 3.095 | 0.000 | 3.095 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The increase of $2.834M from FY17 to FY18 reflects increased test and evaluation supporting mounted CREW development efforts for software load-set development and capability testing of the Modi II CREW System.<br>***FY 2016 Accomplishments:***<br>-Continued test events in support of the CVRJ (V)2, Thor III, Modi II and Universal Test Set (UTS) systems regarding its ability to defeat the RCIED threat in multiple worldwide locations.<br>-Continued testing of the mounted and dismounted CREW production units that will be fielded for Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) use.<br>-Continued compatibility testing against USMC and other services devices to ensure Marine Corps CREW systems maintain required performance capabilities.<br>-Continued characterizing operational limitations regarding the CREW systems and standoff restrictions for its operation.<br>-Continued mounted and dismounted CREW improvements testing to distinguish possible design limitations that can be improved to optimize the Marines use of the system.<br>***FY 2017 Plans:***<br>-Continue test events in support of the CVRJ (V)2, Thor III, Modi II and Universal Test Set (UTS) systems regarding its ability to defeat the RCIED threat in multiple worldwide locations. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2274 / *Command & Control Warfare Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue testing of the mounted and dismounted CREW production units that will be fielded for Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) use.<br>-Continue compatibility testing against USMC and other services devices to ensure Marine Corps CREW systems maintain required performance capabilities.<br>-Continue characterizing operational limitations regarding the CREW systems and standoff restrictions for its operation.<br>-Continue mounted and dismounted CREW improvements testing to distinguish possible design limitations that can be improved to optimize the Marines use of the system.<br>***FY 2018 Base Plans:***<br>-Continue test events in support of the CVRJ (V)2, Thor III, Modi II and Universal Test Set (UTS) systems regarding its ability to defeat the RCIED threat in multiple worldwide locations.<br>-Continue testing of the mounted and dismounted CREW production units that will be fielded for Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) use.<br>-Continue compatibility testing against USMC and other services devices to ensure Marine Corps CREW systems maintain required performance capabilities.<br>-Complete characterizing operational limitations regarding the CREW systems and standoff restrictions for its operation.<br>-Complete mounted and dismounted CREW improvements testing to distinguish possible design limitations that can be improved to optimize the Marines use of the system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *USMC CREW - Management | 3.409 | 3.689 | 2.896 | 0.000 | 2.896 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued to manage the new RCIED techniques development group and hardware engineering team to enhance loadsets upgrades to counter the evolving threat and prevent technology obsolescence for CVRJ(V)2, Thor III, Modi II and the Universal Test Set systems. Conducted system level configuration management activities for all CREW systems.<br>***FY 2017 Plans:***<br>-Continue to manage the new RCIED techniques development group and hardware engineering team to enhance loadsets upgrades to counter the evolving threat and prevent technology obsolescence for CVRJ(V)2, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2274 / *Command & Control Warfare Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Thor III, Modi II and the Universal Test Set systems. Conducting system level configuration management activities for all CREW systems.<br>***FY 2018 Base Plans:***<br>-Continue to manage the new RCIED techniques development group and hardware engineering team to enhance loadsets upgrades to counter the evolving threat and prevent technology obsolescence for CVRJ(V)2, Thor III, Modi II and the Universal Test Set systems. Conducting system level configuration management activities for all CREW systems.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 8.533 | 6.531 | 8.129 | 0.000 | 8.129 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/652000: *CREW* | 0.000 | 75.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW): CREW mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs in all current and future operations. The program will continue to develop new counter techniques, improve capabilities, enhance software and develop upgrades to counter evolving threats and prevent technology obsolescence. Activities include waveform development, non-recurring engineering for system enhancements, capability upgrades, and the testing/government studies required to support these changes. 3100 CVRJ(V1) mounted systems were upgraded with an increased capability, CVRJ(V)2, and fielded to support vehicle convoys. The USMC intends to upgrade the CVRJ(V)2 to counter advance threats facing deployed units. The CVRJ(V)2 upgrade, known as the CVRJ Augmentation Program (CAP) will require performance testing in FY19 before being fielded. The Thor III dismounted systems fielded to OEF and to selected MEU units starting in FY12, will be replaced by the Modi II systems starting in FY18. The Modi II program consists 565 dismounted systems and was initiated as an ongoing effort to develop new techniques, improve capabilities, enhance software and develop waveform loadsets to counter evolving threats and prevent technology obsolescence for the THOR III dismounted systems. The 565 dismounted systems were procured in FY15 with expected delivery in FY16 for product assurance testing in FY17. FY18 plan reflects increased test and evaluation for CREW development efforts to include software load-set development and capability testing of the Modi II CREW System.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | Date: May 2017 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | | | | Project (Number/Name)<br>2275 / *Marine Corps Tactical Radio Systems* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2275: *Marine Corps Tactical Radio Systems* | 36.429 | 4.929 | 15.161 | 22.722 | - | 22.722 | 11.329 | 8.119 | 8.190 | 8.453 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

NOTE: The overall project increase of $7.561M from FY17 to FY18 supports the development and testing of Joint Enterprise Network Manager (JENM); and the testing and evaluation of proposed High Frequency Radio II (HFR II) and MBR Replacement. Funds also be used to support the test and evaluation efforts for the laptop technical refresh as a result of the Department of Defense Chief Information Officer (DoD CIO) Win-10 mandate. Increases to TWTS from FY17 to FY18 supports the NGT MILSTD C/X-Band testing and engineering support.

**A. Mission Description and Budget Item Justification**

Tactical Communications Modernization (TCM): TCM supports the research, testing, and evaluation of non-developmental tactical voice and data radio systems for mounted and dismounted operations within all echelons of the Marine Air Ground Task Force. The testing will ensure the communication systems are joint networking capable and supports National Security Agency (NSA) Communications Security (COMSEC) Modernization requirements. The funding provides contracted engineering support, facility test support, and test reporting for Mobile User Objective System (MUOS) terminals, antennas, and Joint Enterprise Network Manager (JENM).

Networking on the Move (NOTM): NOTM provides a robust command and control (C2) capability by integrating tactical data systems with on the move satellite communications (SATCOM) for beyond line-of-sight ability that allows battlefield commanders to have uninterrupted two-way access to digital data, anywhere on the battlefield. NOTM provides MAGTF commanders and staffs with full Common Operational Picture (COP) access, virtually unlimited situational awareness and a powerful ability to issue digital orders (fires, maneuver, planning) to GCE, ACE and LCE units at all echelons while on-the-move or at-the-halt. NOTM also provides Marine units the capability to link with and extend Defense Information System Network (DISN) services; SIPRNet, NIPRNet, and Defense Switched Networks (DSN). Integrated full motion video (receipt and retransmission), tactical voice communications plus three options for secure wireless local area network (LAN) connectivity between staff members makes this amphibious capability a crucial asset to all elements of the Marine Air-Ground Task Force (MAGTF).

Very Small Aperture Terminal (VSAT): VSAT is an integrated Commercial Off-the-Shelf (COTS) satellite communications terminal with a modular architecture that supports drop and insert architecture through scalable and flexible applications. VSAT uses commercial Ku and military Ka and X frequency bands to provide beyond line-of-sight (BLOS) connectivity to support intra-MAGTF communications (NIPRNET, SIPRNET, and telephony) down to the battalion/squadron level. With the addition of the VSAT-Expeditionary (VSAT-E) the VSAT Family of Systems (FoS) now comes in four modular variants, depending on MAGTF-size and mission. The increase of $0.206M from FY17 to FY18 will support the test and evaluation efforts for the laptop technical refresh as a result of the Department of Defense Chief Information Officer (DoD CIO) Win-10 mandate.

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T is an Army led, ACAT II program. The Marine Corps SMART-T has fielded the full Authorized Acquisition Objective (AAO) of 42 terminals and 35 AN/PSQ-17 Network Planning tools and completed the Advanced Extremely High Frequency (AEHF) upgrades. Out

of warranty repair for legacy components will be executed, when necessary, using the Army National Maintenance Contract. The SMART-T program will procure and field its Terminal Operating Unit (TOU) upgrades in FY17.

Terrestrial Wideband Transmission Systems (TWTS): TWTS is a capabilities portfolio that includes Beyond Line of Sight (BLOS) system (AN/TRC-170A) and Line of Sight (LOS) systems AN/MRC-142 Family of Systems (FoS). The AN/TRC-170A is a transportable BLOS, terrestrial, self-enclosed troposcatter terminal (multichannel) capable of transmitting and receiving digital data over varying distances up to 100 miles. Next Generation Troposcatter (NGT) is a transit case solution which will replace the AN/TRC-170A. AN/MRC-142B provides ship to shore communication. AN/MRC-142C FoS provides LOS, two-way, secure voice and data communications up to 35 miles.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TCM: Product Development | 1.650 | 0.442 | 1.542 | 0.000 | 1.542 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: Increase of $1.1M from FY17 to FY18 will continue to provide for the Marine Corps fair share cost for development of the JENM application required for MUOS. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continued funding for the Marine Corps fair share cost for development of the Joint Enterprise Network Manager (JENM) application required for MUOS. | | | | | |
| ***FY 2017 Plans:***<br>Continued funding the Marine Corps fair share cost for development of the Joint Enterprise Network Manager (JENM) application required for MUOS. Life Cycle Cost Estimate (LCCE) to support High Frequency Radio II (HFR II) | | | | | |
| ***FY 2018 Base Plans:***<br>Initiate the Life Cycle Cost Estimate (LCCE) to support Multi-Band Radio Replacement (MBR R). | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TCM: Engineering and Program Support | 0.103 | 0.082 | 0.030 | 0.000 | 0.030 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued engineering and support efforts. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue engineering and support efforts.<br>***FY 2018 Base Plans:***<br>Continue engineering and support efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TCM: Test and Evaluation Support<br>***Articles:***<br>***Description:*** NOTE: Increase of $3.183M will continue to support MUOS test events and evaluations. In addition, it will fund procurement of test assets for equipment such as HFR II and other TCM Family of Systems (FoS); and funds test events such as software development test, road shock, shake and vibration testing and MIL-STD testing.<br>***FY 2016 Accomplishments:***<br>Completed procurement of (10) MUOS Firmware Licenses for test and evaluation purposes such as, MUOS Mil-STD Testing.<br>***FY 2017 Plans:***<br>Initiate test events in support of the Mobile Objective User System (MUOS) such as environmental and radiation hazard; as well as Field User Evaluations (FUEs).<br>***FY 2018 Base Plans:***<br>Continue to support Mobile Objective User System (MUOS) test events and evaluations.<br>Initiate procurement of test assets for equipment such as HFR II and other TCM Family of Systems (FoS).<br>Initiate test events such as software development test, road shock, shake and vibration testing and MIL-STD testing.<br>***FY 2018 OCO Plans:***<br>N/A | 0.132<br>- | 0.322<br>- | 3.505<br>- | 0.000<br>- | 3.505<br>- |
| ***Title:*** TCM: Management Services<br>***Articles:***<br>***Description:*** Increase of $.153M from FY17 to FY18 supports FFRDC research and engineering efforts for replacement of HFR II and MBR II equipment. | 0.237<br>- | 0.142<br>- | 0.295<br>- | 0.000<br>- | 0.295<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Continued Engineering and Program Support for TCM.<br>***FY 2017 Plans:***<br>Continue Engineering and Program Support for the TCM Family of Systems (FoS).<br>***FY 2018 Base Plans:***<br>Continue Engineering and Program Support for the TCM Family of Systems (FoS).<br>Continue and increase support of FFRDC research and engineering for the replacement of HFRII and MBR II equipment.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** NOTM: Product Development | 1.048 | 5.716 | 6.220 | 0.000 | 6.220 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The increase of $0.504M from FY17 to FY18 will Initiate Light Armored Vehicle (LAV) design and integration, Broadband Meshable Data Link (BMDL), and NOTM Internally Transportable Vehicle (ITV) development efforts.<br>***FY 2016 Accomplishments:***<br>Continued product development for SATCOM denied environment.<br>***FY 2017 Plans:***<br>Continue Engineering Change Proposals (ECPs), technology refreshes to extend the systems life and maintain interoperability and major product improvements to complete the AAO of 140 systems.<br>Initiated development of NOTM Airborne.<br>The increase of $4.668M from FY16 to FY17 is associated with the initiation of NOTM Airborne development efforts and increased effort for NOTM ECPs and technology refreshes.<br>***FY 2018 Base Plans:***<br>Continue Engineering Change Proposals (ECPs), technology refreshes to extend the systems life and maintain interoperability and major product improvements to complete the AAO of 140 systems.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** NOTM: Test and Evaluation Support | 0.718 | 5.870 | 5.161 | 0.000 | 5.161 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued test and evaluation support and testing. | | | | | |
| ***FY 2017 Plans:***<br>Continued test and evaluation support and testing.<br><br>The increase of $5.152M from FY16 to FY17 supports test and evaluation of NOTM-A and NOTM Size, Weight and Power (SWaP) reduction ECPs. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue test and evaluation support and testing for NOTM-A, BMDL, NOTM Size, Weight and Power (SWaP) reduction ECPs, and NOTM ITV efforts. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** VSAT: Product Development | 0.386 | 0.389 | 0.366 | 0.000 | 0.366 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Initiated VSAT Graphic User Interface (GUI) Design and Development; as well as development of the PMAP Tool to support Integrated Master Schedule management. | | | | | |
| ***FY 2017 Plans:***<br>Continue VSAT Graphic User Interface (GUI) Design and Development. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue VSAT GUI Design and Development due to quarterly security software updates. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** VSAT: Engineering and Program Support | 0.239 | 0.252 | 0.254 | 0.000 | 0.254 |
| ***Articles:*** | - | - | - | - | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Supported Engineering Change Proposals (ECPs) that included software upgrades and hardware refreshes. Initiated preliminary analysis on USMC Next Generation SATCOM efforts.<br>***FY 2017 Plans:***<br>Continue ECP engineering support to include Quad-Band Satellite Emulator (QBSE) development.<br>***FY 2018 Base Plans:***<br>Initiate ECPs on modem upgrades and R&D efforts focusing on Next Generation SATCOM.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** VSAT Test and Evaluation<br>***Articles:***<br>***Description:*** Increase of $.211M from FY17 to FY18 supports technical refresh test and evaluation events for items such as Master Reference Terminal (MRT) and laptops.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Initiate test and evaluation for system refreshes such as Master Reference Terminal (MRT) technical refresh and laptop refresh.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 0.211<br>- | 0.000<br>- | 0.211<br>- |
| ***Title:*** VSAT: Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Supported engineering efforts in support of capabilities based assessment for Next Generation SATCOM.<br>***FY 2017 Plans:*** | 0.056<br>- | 0.061<br>- | 0.077<br>- | 0.000<br>- | 0.077<br>- |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Initiate engineering efforts in support of analysis of requirements development.<br>***FY 2018 Base Plans:***<br>Continue engineering efforts in support of analysis of requirements development.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SMART-T: Engineering and Program Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Completed ECP work to support procurement of the Terminal Operating Units (TOU) technical refresh for the AEHF SMART-T.<br>***FY 2017 Plans:***<br>Initiate ECPs to update the operating systems of the AEHF SMART-T, TOU, and Tactical Mission Planning Subsystems (TMPSS). Continued Information Assurance support activities.<br>***FY 2018 Base Plans:***<br>Continue to fund ECPs and Information Assurance support efforts.<br>***FY 2018 OCO Plans:***<br>N/A | 0.080<br>- | 0.055<br>- | 0.087<br>- | 0.000<br>- | 0.087<br>- |
| ***Title:*** SMART-T: Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Initiated engineering analysis on potential future technical upgrades.<br>***FY 2017 Plans:***<br>Continue to provide engineering analysis on potential future technical upgrades.<br>***FY 2018 Base Plans:***<br>Continue to provide engineering analysis on potential future technical upgrades.<br>***FY 2018 OCO Plans:***<br>N/A | 0.100<br>- | 0.134<br>- | 0.100<br>- | 0.000<br>- | 0.100<br>- |
| ***Title:*** TWTS: Product Development | 0.130 | 0.000 | 1.764 | 0.000 | 1.764 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: Increase of $1.764M will initiate NGT Manpower Training Analysis Plan (MPTA/P) and NGT Architecture Development.<br><br>***FY 2016 Accomplishments:***<br>Completed funding the Next Generation Tropo (NGT) Life Cycle Cost Estimate (LCCE).<br><br>***FY 2017 Plans:***<br>N/A<br><br>***FY 2018 Base Plans:***<br>Initiate NGT Manpower Training Analysis Plan (MPTA/P) and NGT Architecture Development.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TWTS: Engineering and Program Support | 0.050 | 1.084 | 1.796 | 0.000 | 1.796 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Increase of $.712M from FY17 to FY18 will continue to fund engineering, safety, logistics and program management support for the Next Generation Tropo (NGT) systems and TWTS Family of Systems (FoS).<br><br>***FY 2016 Accomplishments:***<br>Continued test and evaluation, engineering planning, and program management efforts for TWTS.<br><br>***FY 2017 Plans:***<br>Continue engineering, safety, and program support for the TWTS Family of Systems (FoS).<br>Increase from FY16 to FY17 due to increase of engineering, safety, and program support for the Next Generation Tropo (NGT).<br><br>***FY 2018 Base Plans:***<br>Continue to fund engineering, safety, logistics and program management support for the Next Generation Tropo (NGT) systems and TWTS Family of Systems (FoS).<br><br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** TWTS: Test and Evalution Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Initiate development of test and evaluation plans for Next Generation Tropo (NGT).<br>***FY 2018 Base Plans:***<br>Increase $.689M from FY17 to FY18 will continue test and evaluation events such as MIL-STD testing, NGT JITC certification plan and C/X-band testing in support of Next Generation Tropo (NGT).<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.242<br>- | 0.931<br>- | 0.000<br>- | 0.931<br>- |
| ***Title:*** TWTS Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Initiate engineering and program support for TWTS FoS.<br>***FY 2018 Base Plans:***<br>Continue engineering and program support for TWTS FoS.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.370<br>- | 0.383<br>- | 0.000<br>- | 0.383<br>- |
| **Accomplishments/Planned Programs Subtotals** | 4.929 | 15.161 | 22.722 | 0.000 | 22.722 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4633-1: *TCM* | 31.298 | 39.503 | 17.852 | - | 17.852 | 65.972 | 83.663 | 214.770 | 202.869 | Continuing | Continuing |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4631-2: *NOTM* | 13.825 | 37.461 | 105.740 | 5.600 | 111.340 | 31.422 | 31.548 | 4.700 | 4.847 | Continuing | Continuing |
| • PMC/4633-3: *VSAT* | 1.984 | 6.589 | 2.068 | 4.590 | 6.658 | 4.567 | 3.145 | 3.205 | 3.269 | Continuing | Continuing |
| • PMC/4633-4: *SMART-T* | 0.656 | 0.537 | 0.549 | - | 0.549 | 0.571 | 0.593 | 0.605 | 0.617 | Continuing | Continuing |
| • PMC/4633-5: *TWTS* | 0.999 | 2.300 | 12.237 | - | 12.237 | 14.911 | 17.921 | 15.234 | 15.484 | Continuing | Continuing |
| • PMC/7000-1: *SMART-T Spares* | 0.000 | 0.201 | 0.205 | - | 0.205 | 0.210 | 0.215 | 0.219 | 0.223 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Tactical Communications Modernization (TCM): TCM will maximize the use of non-developmental radio solutions to meet the next generation of Marine Corps tactical radio requirements. The Mobile User Objective System (MUOS) effort will utilize terminal licenses and receive antennas via a bailment agreement for testing at contracted government test labs to include environmental, shock, electromagnetic compatibility and interoperability testing. High Frequency Radios II (HFR II) contracting strategy will maximize the use of non-developmental high frequency radios while promoting competition by having industry provide proposed HFR II solutions, validated by Military Standard tests with best value selection upon successful completion of tests.

Networking on the Move (NOTM): NOTM will use an evolutionary acquisition strategy that leverages Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) technology to procure, sustain and meet emerging requirements. The design of the system provides for internal growth capability through an open system architecture enabling technology refresh to extend the system's life, maintain interoperability, Information Assurance (IA) compliance, and reduce costs due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). It is envisioned that technology refresh will occur on the NOTM hardware and software periodically due to component obsolescence, user-driven requests for improvements, IA compliance, and mission-related requirements. Refresh will include investments to incorporate evolving capability to ensure compatibility with other systems, create lighter more efficient equipment, and keep pace with evolving software requirements. End-of-life equipment refresh is expected throughout the program's life cycle and may be managed through kit purchases, replacement through Engineering Change Proposals (ECPs), or as replacement parts as equipment is repaired.

Very Small Aperture Terminal (VSAT): The acquisition of the external antenna is a single step acquisition which is adding capability to the VSAT-L terminal. The external antenna provides a dual shot capability that replaces the LMST and Phoenix systems. The VSAT FoS' approach on technology refresh and sub-component upgrades due to obsolescence and IA security issues is evolutionary. This strategy is based on procuring the latest mature and supported Commercial Off The Shelf (COTS) technology to keep the systems technology relevant to continue to meet mission requirements. Individual VSAT FoS programs will submit Engineering Change Proposals (ECP) for technology refresh modifications due to subcomponent obsolescence. The ECP will support the latest iteration of the Original Equipment Manufacturer (OEM) COTS equipment. This is a life cycle sustainment effort that maintains common logistical elements without re-engineering for form, fit, and function whenever warranted, with continued support of formal school training curriculum for relevant VSAT FoS hardware and software (firmware) functions.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T is an Army led, ACAT II program. The Marine Corps SMART-T has fielded the full Authorized Acquisition Objective (AAO) of 42 terminals and 35 AN/PSQ-17 Network Planning tools and completed the Advanced Extremely High Frequency (AEHF) upgrades. Out of warranty repair for legacy components will be executed, when necessary, using the Army National Maintenance Contract. The SMART-T program will procure and field its Terminal Operating Unit (TOU) upgrades in FY17.

Terrestrial Wideband Transmission Systems (TWTS): AN/TRC-170A, the current Marine Corps troposcatter capability, was initially fielded in 1992. Next Generation Troposcatter (NGT) will replace AN/TRC-170A due to the system's obsolescence and an approved NGT Joint DOTmLPF-P Change Recommendation (DCR). The Marine Corps plans to leverage the US Army requirement and partner with their Program office.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2275 / *Marine Corps Tactical Radio Systems* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM JENM Development | SS/CPFF | ARL : Aberdeen,MD | 0.000 | 1.650 | May 2016 | 0.407 | Feb 2017 | 1.407 | Feb 2018 | - | | 1.407 | Continuing | Continuing | Continuing |
| TCM FoS LCCEs | C/IDIQ | MCSC : Quantico, VA | 0.000 | 0.000 | | 0.035 | Apr 2017 | 0.135 | Dec 2017 | - | | 0.135 | 0.000 | 0.170 | - |
| NOTM Development | C/CPFF | SSC-LANT : Charleston, SC | 2.239 | 0.000 | | 1.941 | May 2017 | 1.383 | May 2018 | - | | 1.383 | Continuing | Continuing | Continuing |
| NOTM Development | WR | SSC-Pacific : San Diego, CA | 0.473 | 0.048 | Mar 2016 | 1.038 | Feb 2017 | 0.712 | Feb 2018 | - | | 0.712 | Continuing | Continuing | Continuing |
| NOTM SWAP | MIPR | DTIC : Fort Belvoir, VA | 0.398 | 1.000 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.398 | - |
| NOTM-A | WR | SSC-Atlantic : Charleston, SC | 0.000 | 0.000 | | 1.737 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.737 | - |
| NOTM-A | C/CPFF | DTIC : Fort Belvoir, VA | 0.000 | 0.000 | | 1.000 | Jun 2017 | 1.125 | Feb 2018 | - | | 1.125 | 0.000 | 2.125 | - |
| NOTM-ITV | WR | SSC-A : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 0.750 | Feb 2018 | - | | 0.750 | 0.000 | 0.750 | - |
| NOTM BMDL SATCOM | WR | ARL : Aberdeen, MD | 0.000 | 0.000 | | 0.000 | | 2.250 | Mar 2018 | - | | 2.250 | 0.000 | 2.250 | - |
| VSAT GUI Development | C/FFP | CECOM : Aberdeen, MD | 0.000 | 0.136 | Apr 2016 | 0.389 | May 2017 | 0.366 | Apr 2018 | - | | 0.366 | 0.000 | 0.891 | - |
| VSAT PdMAP Development | C/FFP | NAWC - TSD : Orlando, FL | 0.000 | 0.250 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.250 | - |
| TWTS NGT Architecture Development | C/FFP | MCSC : Quantico, VA | 0.000 | 0.000 | | 0.000 | | 0.200 | Nov 2017 | - | | 0.200 | Continuing | Continuing | Continuing |
| TWTS NGT LCCE | C/IDIQ | MCSC : Quantico, VA | 0.000 | 0.130 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.130 | - |
| TWTS NGT MPTA/P Initiation | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 1.564 | Dec 2017 | - | | 1.564 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | Various : Various | 10.660 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.660 | - |
| | | **Subtotal** | 13.770 | 3.214 | | 6.547 | | 9.892 | | - | | 9.892 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2275 / *Marine Corps Tactical Radio Systems* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM Engineering Support | C/FFP | NAVAIR : Pax River, MD | 0.108 | 0.103 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.211 | - |
| TCM Engineering Support | Various | MCSC : Quantico, VA | 0.000 | 0.000 | | 0.082 | Sep 2017 | 0.030 | Sep 2018 | - | | 0.030 | Continuing | Continuing | Continuing |
| VSAT Engineering Support | WR | SSC-PAC : San Diego, CA | 0.000 | 0.239 | Feb 2016 | 0.252 | Feb 2017 | 0.254 | Feb 2018 | - | | 0.254 | Continuing | Continuing | Continuing |
| SMART-T Engineering Support | WR | SSC-LANT : Charleston, SC | 0.177 | 0.080 | Mar 2016 | 0.055 | Mar 2017 | 0.087 | Mar 2018 | - | | 0.087 | Continuing | Continuing | Continuing |
| TWTS Engineering Support | C/CPFF | NAVAIR : Pax River, MD | 0.000 | 0.050 | Sep 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.050 | - |
| TWTS NGT Safety Support | C/CPFF | NSWC : Indian Head, MD | 0.000 | 0.000 | | 0.193 | May 2017 | 0.227 | Feb 2018 | - | | 0.227 | Continuing | Continuing | Continuing |
| TWTS Program Management Support | Various | MCSC : Quantico, VA | 0.000 | 0.000 | | 0.891 | Aug 2017 | 1.339 | May 2018 | - | | 1.339 | Continuing | Continuing | Continuing |
| TWTS NGT Logistics Support | WR | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.230 | May 2018 | - | | 0.230 | Continuing | Continuing | Continuing |
| Prior Years Cumulative Funding | Various | Various : Various | 1.062 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.062 | - |
| | | **Subtotal** | 1.347 | 0.472 | | 1.473 | | 2.167 | | - | | 2.167 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM Antenna Environmental Test | WR | SSC-Lant : Charleston, SC | 0.000 | 0.032 | Jul 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.032 | - |
| TCM MUOS Test Assets | C/FFP | MCSC : Quantico, VA | 0.000 | 0.100 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.100 | - |
| TCM RADHAZ PF Analysis | WR | NSWC Dahlgren : Dahlgren, VA | 0.000 | 0.000 | | 0.054 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.054 | - |
| TCM HFR II Test Assets | C/FFP | MCSC : Quantico, VA | 0.000 | 0.000 | | 0.000 | | 2.455 | Jun 2018 | - | | 2.455 | 0.000 | 2.455 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2275 / *Marine Corps Tactical Radio Systems* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM FoS Test Activities | TBD | TBD : TBD | 0.000 | 0.000 | | 0.268 | Sep 2017 | 1.050 | Feb 2018 | - | | 1.050 | Continuing | Continuing | Continuing |
| NOTM Vehicle Integration Testing | WR | SSC-LANT : Charleston, SC | 0.828 | 0.185 | May 2016 | 0.000 | | 1.975 | Feb 2018 | - | | 1.975 | Continuing | Continuing | Continuing |
| NOTM-A Testing | C/CPFF | DTIC : Fort Belvoir, VA | 0.000 | 0.000 | | 4.113 | Jun 2017 | 1.686 | Feb 2018 | - | | 1.686 | 0.000 | 5.799 | - |
| NOTM-A Testing | WR | NSWC Crane : Crane, IN | 0.000 | 0.000 | | 0.000 | | 0.750 | Feb 2018 | - | | 0.750 | 0.000 | 0.750 | - |
| NOTM-A Testing | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.750 | Feb 2018 | - | | 0.750 | 0.000 | 0.750 | - |
| NOTM EOL | C/FFP | SSC_LANT : Charleston, SC | 0.000 | 0.236 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.236 | - |
| NOTM Power Distribution Retrofit ECP | C/CPFF | DTIC : Fort Belvoir, VA | 0.000 | 0.297 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.297 | - |
| NOTM SWAP Reduction ECP | C/CPFF | SSC-LANT : Charleston, SC | 0.000 | 0.000 | | 1.757 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.757 | - |
| VSAT Testing | MIPR | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.211 | Feb 2018 | - | | 0.211 | Continuing | Continuing | Continuing |
| TWTS T&E Support | C/FFP | Dept. of Human Health and Services : Rockville, MD | 0.000 | 0.000 | | 0.242 | Dec 2017 | 0.366 | Feb 2018 | - | | 0.366 | Continuing | Continuing | Continuing |
| TWTS NGT MILSTD c/x-band Testing | TBD | SPAWAR : TBD | 0.000 | 0.000 | | 0.000 | | 0.365 | Dec 2017 | - | | 0.365 | Continuing | Continuing | Continuing |
| TWTS NGT JTIC Certification Plan | TBD | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.200 | Nov 2017 | - | | 0.200 | 0.000 | 0.200 | - |
| Prior Years Cumulative Funding | Various | Various : Various | 9.596 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.596 | - |
| | | **Subtotal** | 10.424 | 0.850 | | 6.434 | | 9.808 | | - | | 9.808 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

**Management Services ($ in Millions)**

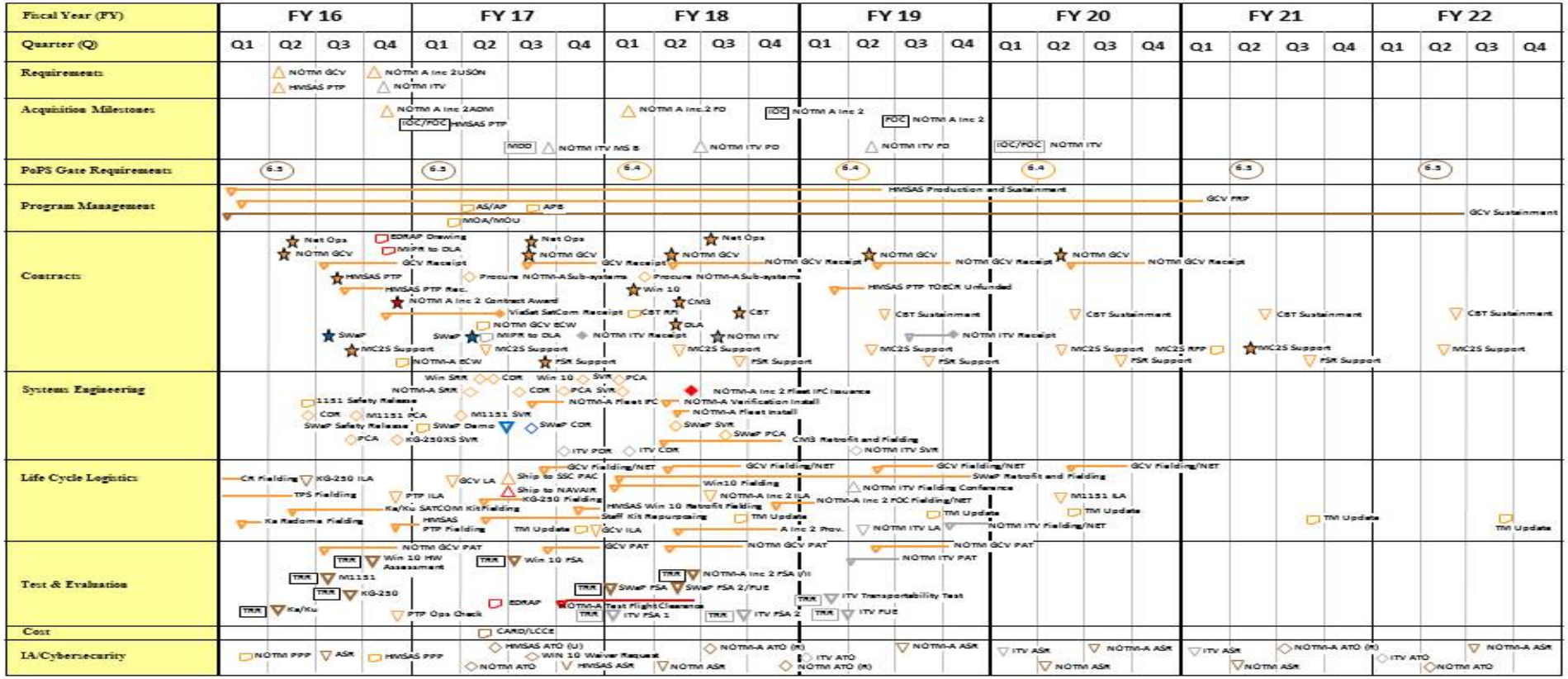
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM Engineering Support | FFRDC | US Army, MITRE : Stafford, VA | 0.237 | 0.237 | Sep 2016 | 0.142 | Feb 2017 | 0.295 | Feb 2018 | - | | 0.295 | Continuing | Continuing | Continuing |
| VSAT Engineering Support | FFRDC | US Army, MITRE : Stafford, VA | 4.953 | 0.056 | Apr 2016 | 0.061 | Feb 2017 | 0.077 | Feb 2018 | - | | 0.077 | Continuing | Continuing | Continuing |
| SMART-T Engineering Support | FFRDC | US Army, MITRE : Stafford, VA | 0.000 | 0.100 | Apr 2016 | 0.134 | Feb 2017 | 0.100 | Feb 2018 | - | | 0.100 | Continuing | Continuing | Continuing |
| TWTS Engineering Support | FFRDC | US Army, MITRE : Stafford, VA | 0.000 | 0.000 | | 0.370 | Feb 2017 | 0.383 | Feb 2018 | - | | 0.383 | Continuing | Continuing | Continuing |
| Prior Year Cumulative Funding | FFRDC | US Army, MITRE : Stafford, VA | 5.698 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 10.888 | 0.393 | | 0.707 | | 0.855 | | - | | 0.855 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 36.429 | 4.929 | | 15.161 | | 22.722 | | - | | 22.722 | - | - | - |

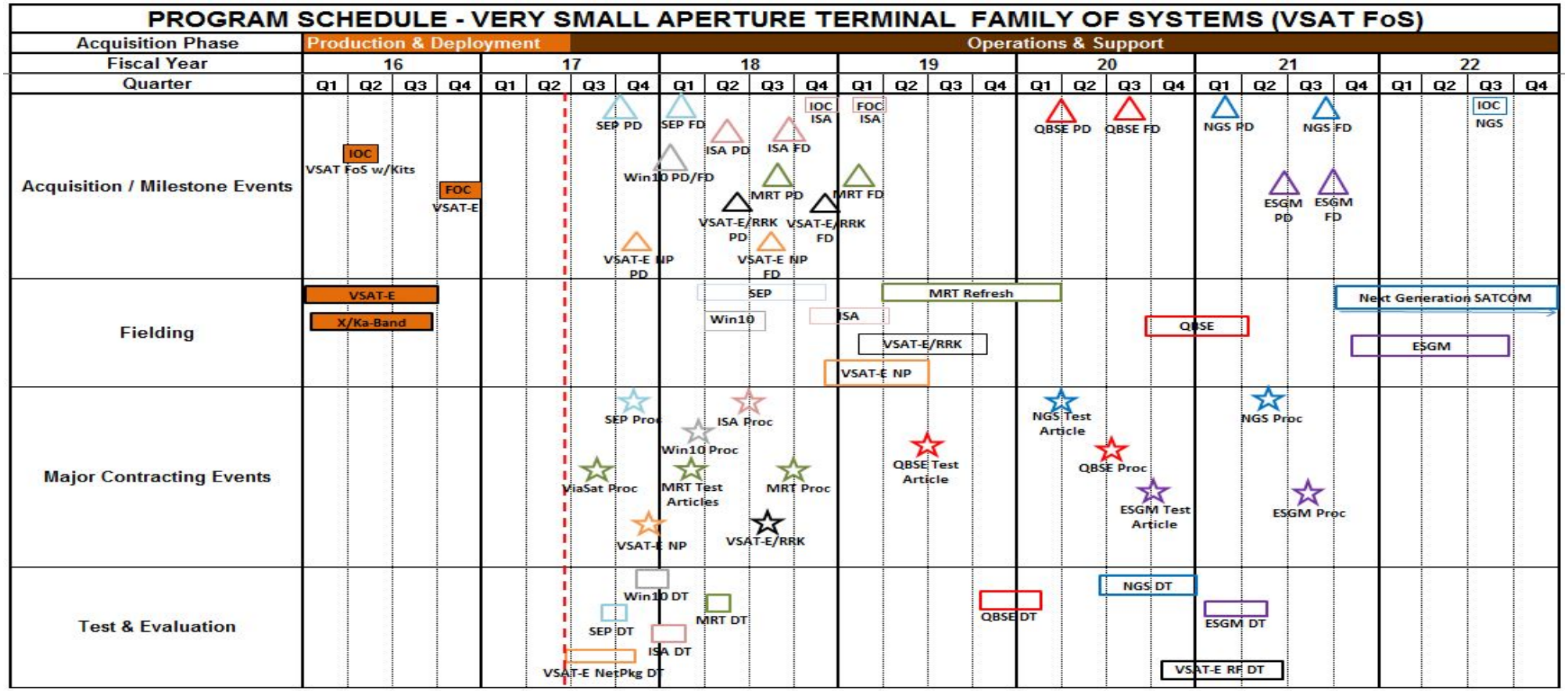
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

# Networking On The Move (NOTM)

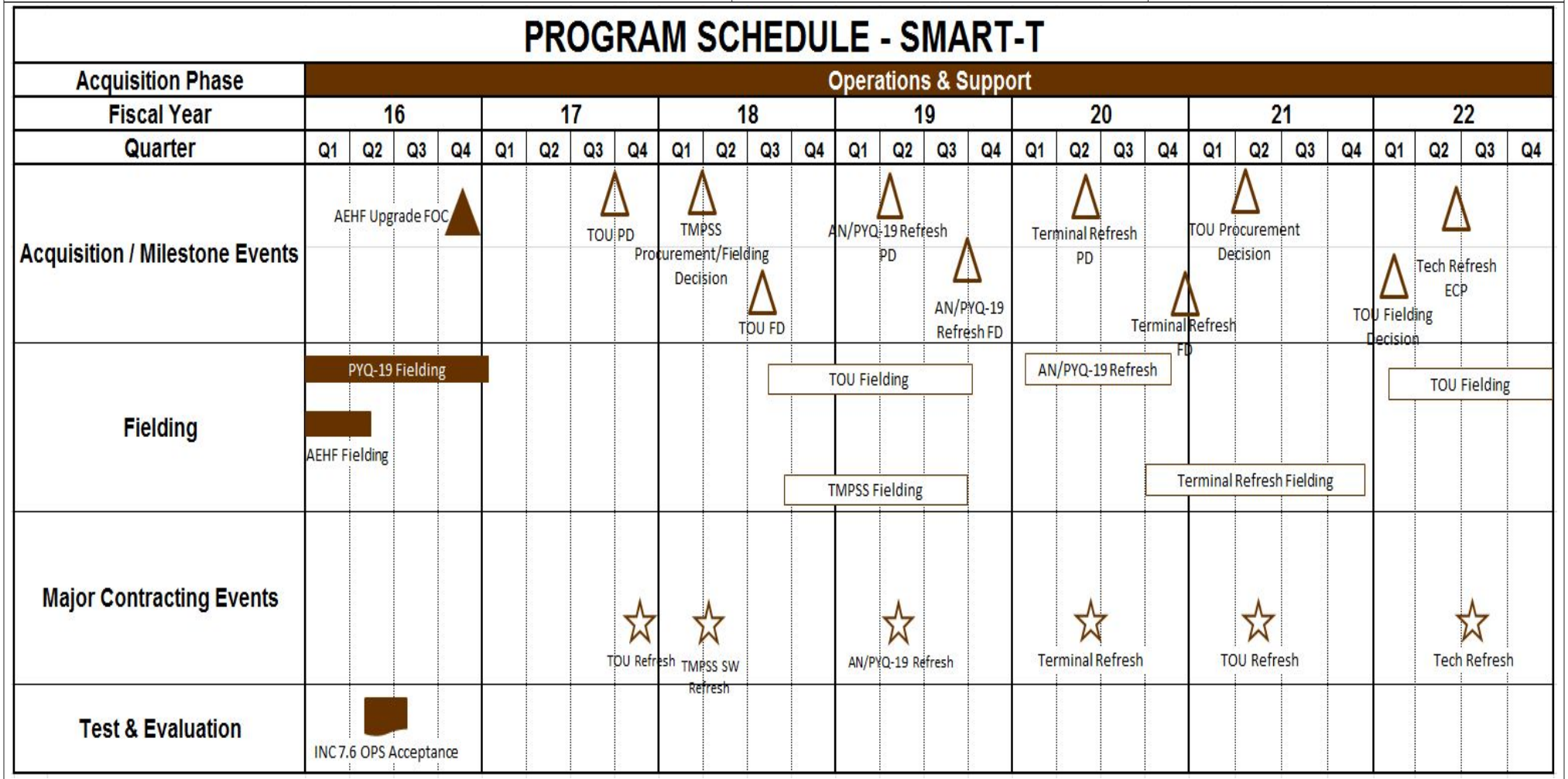


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |



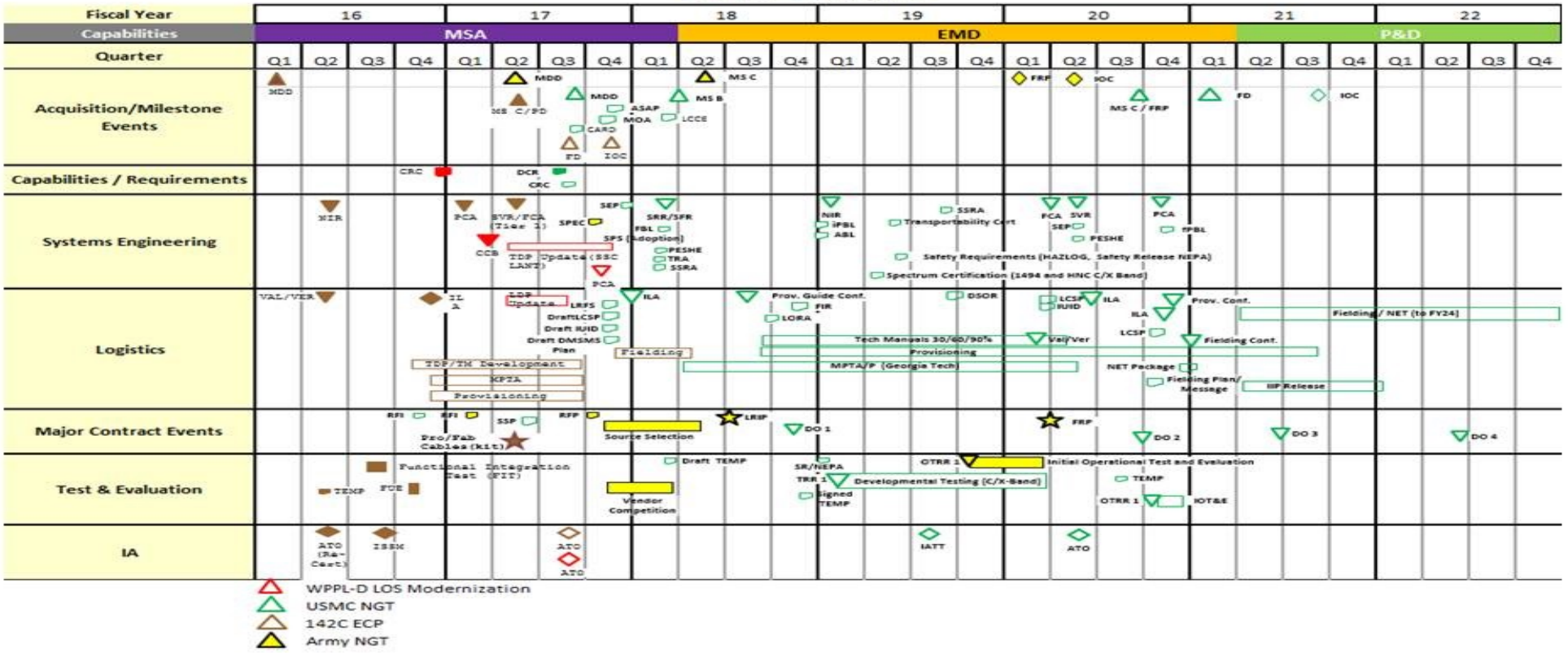

SEP: Signal Entry Panel (VSAT Large)
ISA: Inflatable Satellite Antenna (VSAT FoS and SCI Comm HBSI-PT
MRT: Master Reference Terminal
NGS: Next Generation Satellite
QBSE: Quad-band Satellite Emulator

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |



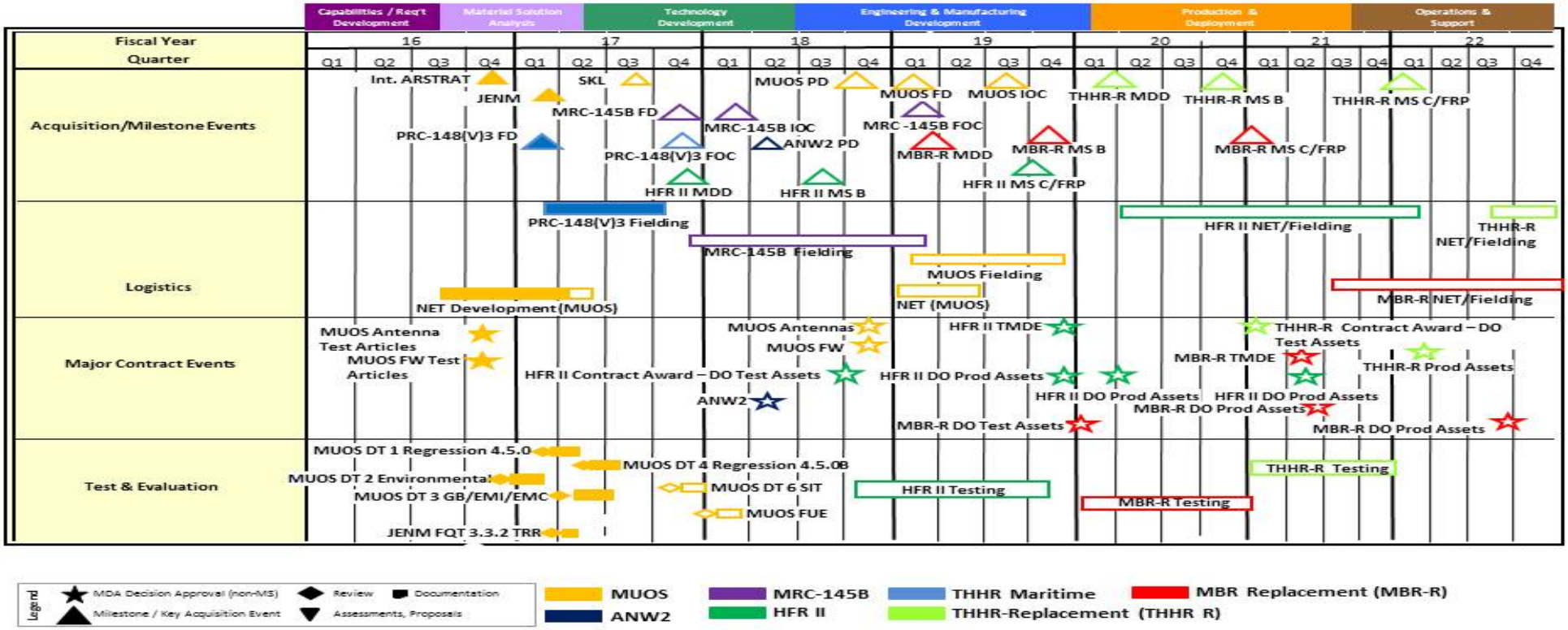
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

## TWTS Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

# TCM Schedule



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2275*** | | | | |
| TCM MRC-145B Fielding Decision | 4 | 2017 | 4 | 2017 |
| TCM PRC-148 V3 FOC | 4 | 2017 | 4 | 2017 |
| TCM MRC-145B IOC | 1 | 2018 | 1 | 2018 |
| TCM MUOS Procurement Decision | 4 | 2018 | 4 | 2018 |
| TCM MUOS Contract Award | 4 | 2018 | 4 | 2018 |
| TCM HFR II Contract Award | 4 | 2018 | 4 | 2018 |
| TCM MUOS Fielding Decision | 1 | 2019 | 1 | 2019 |
| TCM MUOS IOC | 3 | 2019 | 3 | 2019 |
| TCM HFR II-M MS C / FRP | 4 | 2019 | 4 | 2019 |
| VSAT VIASAT Procurement | 3 | 2017 | 3 | 2017 |
| VSAT Signal Entry Panel Procurement | 4 | 2017 | 4 | 2017 |
| VSAT-E RRK Network Package Refresh Procurement | 4 | 2017 | 4 | 2017 |
| VSAT Signal Entry Panel Fielding | 1 | 2018 | 4 | 2018 |
| VSAT WIN 10 Procurement | 1 | 2018 | 1 | 2018 |
| VSAT Inflatable Satellite Antenna Procurement | 2 | 2018 | 2 | 2018 |
| VSAT WIN 10 Fielding | 2 | 2018 | 3 | 2018 |
| VSAT Inflatable Satellite Antenna Fielding | 4 | 2018 | 2 | 2019 |
| VSAT-E Network Package Refresh Fielding | 4 | 2018 | 3 | 2019 |
| VSAT MRT Procurement | 4 | 2018 | 4 | 2018 |
| VSAT MRT Fielding | 2 | 2019 | 1 | 2020 |
| SMART-T WIN-T TOU Procurement | 4 | 2017 | 4 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2275 / *Marine Corps Tactical Radio Systems* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| SMART-T TMPSS Procurement | 2 | 2018 | 2 | 2018 |
| SMART-T TOU Fielding | 3 | 2018 | 4 | 2019 |
| SMART-T TMPSS Fielding | 3 | 2018 | 4 | 2019 |
| TWTS MRC-142C MS C/PD | 2 | 2017 | 2 | 2017 |
| TWTS MRC-142C FD | 3 | 2017 | 3 | 2017 |
| TWTS NGT MDD | 3 | 2017 | 3 | 2017 |
| TWTS MRC-142C IOC | 4 | 2017 | 4 | 2017 |
| TWTS NGT MS B | 2 | 2018 | 2 | 2018 |
| TWTS NGT MS C/ FRP | 3 | 2020 | 3 | 2020 |
| TWTS NGT FD | 1 | 2021 | 1 | 2021 |
| TWTS NGT IOC | 3 | 2021 | 3 | 2021 |
| NOTM-A Fielding Decision | 1 | 2018 | 1 | 2018 |
| NOTM-A Inc 2 IOC | 4 | 2018 | 4 | 2018 |
| NOTM-A Inc 2 FOC | 2 | 2019 | 2 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2276 / *Comms Switching and Control Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2276: *Comms Switching and Control Sys* | 40.765 | 1.938 | 2.216 | 2.799 | - | 2.799 | 2.618 | 2.748 | 2.808 | 2.663 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

The FY 2018 funding request was increased by $0.583M to account for the redesign of the CDN systems to reduce size, weight, and power (SWaP).

**A. Mission Description and Budget Item Justification**

(U) Network Planning & Management (NPM) is a portfolio of communications planning and Network Management applications for use throughout the Marine Air-Ground Task Force (MAGTF). NPM consists of items such as the Systems Planning Engineering and Evaluation Device (SPEED). NPM provides the Marine Forces (MARFOR) component planners with the ability to conduct high-level planning; detailed planning and engineering; monitoring; control and reconfiguration; and spectrum planning and management in support of Combatant Commander (COCOM) and Commander, Joint Task Force (CJTF) operations. SPEED provides High Frequency (HF) predictions, Line of Site (LOS) propagation, Radio Coverage Analysis (RCA), Satellite Planning, Command and Control Personal Computer (C2PC) track interface, interference and de-confliction analysis, spectrum management, Radio Guard Charts, Comm-On-The-Move (COTM), and T/E (training & education) and force structure management.

(U) Tactical Voice Switching System (TVSS): The TVSS is a modular Integrated Services Digital Network (ISDN) circuit switch capable system that combines voice and Voice Over Internet Protocol telecommunications, multiplexing, transmission encryption, and group modem capabilities in one system for command, control, administrative, and logistic voice communications. Facilitates secure and non-secure voice, circuit switching functions, and network routing and management functions with current fielded tactical systems of the military services. Interoperates with joint, coalition, and host nation networks, and operates in unclassified and classified environments. Decrease of $0.202M between FY17 and FY18 represents reduced requirements to support technical refreshes.

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): The CDN provides the commander a modular, integrated, and interoperable Internet Protocol (IP)- based LAN and WAN data networking capability that forms the data communications backbone and data communications support to organizations within a MAGTF. The CDN provides extension of the Defense Information System Network (DISN), Secret Internet Protocol Router Network (SIPRNet), Sensitive But Unclassified (SBU), Non-secure Internet Protocol Router Network (NIPRNet) as well as a Coalition networking capability and access to strategic, supporting establishments, joint and other service component tactical data networks for Marine Corps Tactical Data Systems (TDSs) and other CDN. The CDN provides Marine Corps maneuver elements with a modular and scalable IP data transport capability that will replace, supplement and be used with existing legacy data systems through the integration of computers, routers, data switches and cabling, radio net interface units, modems, link encryption devices, and patch panels. Uninterrupted Power Supplies (UPS) provide for emergency power and continuity of operations. The CDN can operate from the SBU up to the Top Secret/Sensitive Compartmented Information (TS/SCI) level and contains integral In-line Network Encryption (INE) device supporting IP Security (IPSec) and Virtual Private Networking (VPN). Increase of $0.794M from FY17 to FY18 provides for design, testing, and procurement of prototypes and test articles in support of the reconfiguration of Battalion and below CDN systems to reduce size, weight, and power (SWaP).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2276 / *Comms Switching and Control Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** NPM: Product Development | 0.935 | 0.914 | 0.905 | 0.000 | 0.905 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued to provide additional enhancements and capabilities within the System Planning Engineering and Evaluation Device (SPEED) software testing. | | | | | |
| ***FY 2017 Plans:***<br>Continues to provide additional enhancements and capabilities within the System Planning Engineering and Evaluation Device (SPEED) software testing. | | | | | |
| ***FY 2018 Base Plans:***<br>Continues to provide additional enhancements and capabilities within the System Planning Engineering and Evaluation Device (SPEED) software testing. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TVSS: Engineering and Program Support | 0.000 | 0.011 | 0.010 | 0.000 | 0.010 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Provides program and requirements management of technology, Information Assurance and end of life/end of component support. | | | | | |
| ***FY 2018 Base Plans:***<br>Continues program and requirements management of technology, Information Assurance and end of life/end of component support. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TVSS: Test & Evaluation | 0.213 | 0.106 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2276 / *Comms Switching and Control Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** Decrease $0.106M from FY17 to FY18 reflects program transition to requirements management for end of life/end of component upgrades.<br><br>***FY 2016 Accomplishments:***<br>Funds supported testing of the session border control and program engineering support.<br><br>***FY 2017 Plans:***<br>Funds support testing and evaluation for Information Assurance and end of life/end of component upgrades.<br><br>***FY 2018 Base Plans:***<br>N/A<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** TVSS: Management Services | 0.000 | 0.152 | 0.057 | 0.000 | 0.057 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Decrease of $0.095M reflects reduced requirements as program transitions to VoIP.<br><br>***FY 2016 Accomplishments:***<br>N/A<br><br>***FY 2017 Plans:***<br>Continue engineering, testing and technical support for Information Assurance and end of life/end of component upgrades.<br><br>***FY 2018 Base Plans:***<br>Continue engineering testing and technical support and end of life support component upgrades. Reduced requirements as program transitions to VoIP.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** CDN: Product Development | 0.200 | 0.290 | 0.430 | 0.000 | 0.430 |
| ***Articles:*** | - | - | - | - | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2276 / *Comms Switching and Control Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** $.140 increase from FY17 to FY18 supports Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems.<br><br>***FY 2016 Accomplishments:***<br>Continued development and implementation of required hardware updates such as switches.<br><br>***FY 2017 Plans:***<br>Continue development and implementation of required hardware updates such as servers.<br><br>***FY 2018 Base Plans:***<br>Continue development and implementation of required hardware updates.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** CDN: Engineering and Program Support<br>***Articles:***<br><br>***Description:*** The increase of $.0.098M from FY17 to FY18 will support Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems.<br><br>***FY 2016 Accomplishments:***<br>N/A<br><br>***FY 2017 Plans:***<br>Initiate efforts to support engineering change proposals in support of Network Optimization.<br><br>***FY 2018 Base Plans:***<br>Continues efforts to support engineering change proposals.<br><br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.042<br>- | 0.140<br>- | 0.000<br>- | 0.140<br>- |
| ***Title:*** CDN: Test and Evaulation<br>***Articles:***<br><br>***Description:*** $0.075M increase from FY17 to FY18 reflects transition to engineering for Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems. | 0.300<br>- | 0.535<br>- | 0.610<br>- | 0.000<br>- | 0.610<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2276 / *Comms Switching and Control Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Supported joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for equipment such as switches.<br>***FY 2017 Plans:***<br>Continues support for interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for equipment such as servers.<br>***FY 2018 Base Plans:***<br>Continue support for joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** CDN: Management Services<br>***Articles:***<br>***Description:*** The increase of $0.481M from FY17 to FY18 supports initiation of technology research for Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems.<br>***FY 2016 Accomplishments:***<br>Continued FFRDC systems engineering efforts, interoperability analysis, acquisition planning, support for technology research and obsolescence.<br>***FY 2017 Plans:***<br>Continues FFRDC systems engineering efforts, interoperability analysis, acquisition planning, support for technology research and obsolescence.<br>***FY 2018 Base Plans:***<br>Continue FFRDC systems engineering efforts, interoperability analysis, acquisition planning, support for technology research and obsolescence.<br>Initiate FFRDC efforts in support of Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems.<br>***FY 2018 OCO Plans:*** | 0.290<br>- | 0.166<br>- | 0.647<br>- | 0.000<br>- | 0.647<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2276 / *Comms Switching and Control Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.938 | 2.216 | 2.799 | 0.000 | 2.799 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4634-1: *TVSS* | 8.845 | 20.844 | 8.350 | - | 8.350 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/4634-2: *CDN* | 48.965 | 43.967 | 44.628 | - | 44.628 | 43.237 | 35.956 | 36.732 | 37.506 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

(U) Network Planning and Management (NPM): NPM will maximize use of existing Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) products. NPM will continue to be upgraded as technology advances. Major focus will be on the incorporation of additional capabilities and functionality into the SPEED software to meet user requirements. R&D effort will focus on the development, integration, and testing of improved versions of existing capabilities.

(U) Tactical Voice Switching System (TVSS) (formerly Transition Switch Module (TSM)): TVSS will maximize use of existing COTS, GOTS, and Government-Furnished Equipment (GFE). TVSS hardware and software will continue to be upgraded and improved as technology advances. Major focus will be on interoperability and compatibility with existing systems and components in the Marine Corps, as well as Joint and Coalition forces. R&D effort will focus on integration and testing of improved versions of existing components.

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): CDN will maximize use of existing COTS, GOTS, and GFE. CDN hardware and software will continue to be upgraded and improved as technology advances. Major focus will be on interoperability and compatibility with existing systems and components in the Marine Corps, as well as Joint and Coalition forces. R&D effort will focus on integration and testing of improved versions of existing components. CDN may reuse other Services' development and utilize external contracts that satisfy requirements and analysis of alternatives.

**E. Performance Metrics**

Milestone reviews and technical reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
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| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2277 / *System Engineering and Integration* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2277: *System Engineering and Integration* | 38.330 | 5.013 | 4.861 | 8.314 | - | 8.314 | 5.582 | 6.079 | 6.395 | 6.402 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project provides funds for engineering, test, and evaluation activity, which ensures that the systems being developed within the Program Element (PE) employ consistent standards for interoperability and to the maximum extent feasible use of hardware and software which is uniform and standard across programs.

Expeditionary Energy Office (E2O): Energy is a top priority for the USMC and one of the six pillars of Modernization for the Corps identified by the Commandant. In 2009, the Commandant established the USMC Expeditionary Energy Office (E2O), with the mission to analyze, develop, and direct the Marine Corps' energy strategy in order to optimize expeditionary capabilities across all warfighting functions. E2O's role is to advise the Marine Requirements Oversight Council (MROC) on all energy and resource related requirements, acquisitions, and programmatic decisions. This office and funding directly support execution of the USMC Expeditionary Energy Strategy and Implementation Plan (Mar 2011), and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment (Sep 2011), as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. The Marine Corps program aligns with the Commandant's Planning Guidance 2010, the National Defense Authorization Act 2009, DoD directives and SECNAV goals. This funding will support the achievement of the Strategy, and the activities of the USMC Expeditionary Energy Concepts process, managed by the E2O.

Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a Joint Chiefs-of-Staff (JCS)/DoD-mandated program for joint development, implementation, and testing of tactical data links and US Message Text Format (MTF) under the direction of the Defense Information Systems Agency (DISA) and Office of the Secretary of Defense/ Networks and Information Integration (OASD/NII) per the Commander Joint Chiefs of Staff (CJCSI) Instructions 6610.01C and CJCS16241.04 respectively. This effort also covers interoperability and testing of tactical message standards such as MILSTD 6017 Variable Message Format used between the US Army and USMC; and Coalition message formats the Joint Command, Control, Consultation Information Exchange Data Model (JC3IEDM). Responsible for the development of Net Centric standards (XML, Web Services) to meet requirements of USMC/DoD/Coalition Net Centric Data Strategies. Efforts in this area include NATO Coalition interoperability initiatives, Army/Marine Corps Board support, and interoperability testing and certification to include cross domain.

Systems Engineering, Integration and Coordination (SEIC) is MCSC Chief Engineer's systems engineering and integration program. SEIC provides the decision support tools and engineering analysis resources needed to assess, identify and resolve MAGTF inter-systems' SoS issues and challenges. SEIC supports DC CD&I, DC PP&O, DC A, DC I&L, DC M&RA, HQMC C4, and HQMC INT in the analysis, evaluation, and assessment of MAGTF Systems and SoS requirements. SEIC centralized management of C4ISR programs allows the implementation of systems engineering certification process in support of milestone decision approval; a requirements and functional analysis process enabling system of systems engineering and an overarching C4ISR systems architecture, and a product realization process to support budget decisions. SEIC engineering conducts functional analyses for emergent system of systems challenges and ensures seamless integration and maximum interoperability of materiel across USMC, Naval, Joint, and DoD programs consistent with the Commandant's Vision and Strategy 2025.

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Marine Civil Information Management System (MARCIMS) is a system of systems comprised of people, process and technology that operates in the full Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment. It is a force multiplier for the commander that allows him to leverage the process of Planning, Collection, Consolidation, Analysis, Production, and sharing of civil information in order to support the visualization and understanding of the civil environment to the military commander's decision making process.

Public Affairs System (PAS) provides the Marine Air Ground Task Force (MAGTF) and the broader Marine Corps the capability to research, understand and affect the information environment. PA Marines and Systems enable commanders at all levels and across the range of military operations to engage domestic and foreign publics whose trust, confidence, and understanding are mission critical. The Public Affairs Systems (PAS) AAP identifies and fields materiel solutions required to research and plan communication initiatives, acquire still and video visual information, produce and disseminate communication products, and assess the effects of communication initiatives within the information environment. The program maintains an evolutionary approach to acquisitions, and leverages commercial industry-standard non-developmental items to provide the best value to the Marine Corps, while keeping PA Marines appropriately equipped to understand and affect the information environment. This effort supports research and evaluate solutions to modernize the Public Affairs Still Acquisition System into a single handheld device with the capability to acquire, edit and transmit still and video imagery and engage publics via traditional and social media.

The Military Information Support Operations (MISO)Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. The MISO was established in response to multiple Marine Requirements Oversight Council Memorandums, and the approval of a MISO Organizational and Operational (O&O) Concept, 16 June 2015. MISO capabilities are critical to the success of the MAGTF mission, enabling commanders to shape the information environment, counter enemy propaganda, misinformation, disinformation, and adversarial narratives. The Signature Management (SIGMAN) capability will support MAGTF Operations with a baseline capability to include Own-force signature monitoring and assessment, Electromagnetic signature masking and projection, and physical decoys.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Expeditionary Energy Office (E2O) | 2.140 | 2.159 | 2.199 | 0.000 | 2.199 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Energy harvesting; hybrid power; efficient heating and cooling of | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| people, equipment and water; energy storage; energy efficient vehicles; energy metering and monitoring and decision tools; energy efficient shelters and sustainment.<br>***FY 2017 Plans:***<br>- Continue to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Energy harvesting; hybrid power; efficient heating and cooling of people, equipment and water; energy storage; energy efficient vehicles; energy metering and monitoring and decision tools; energy efficient shelters and sustainment.<br>***FY 2018 Base Plans:***<br>- Continue to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the<br>USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as<br>Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O<br>will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Energy harvesting; hybrid power; efficient heating and cooling of people, equipment and water; energy storage; energy efficient vehicles; energy metering and monitoring and decision tools; energy efficient shelters and sustainment.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** JINTACCS: JCS and DoD CIO Data Links Testing | 0.403 | 0.598 | 0.572 | 0.000 | 0.572 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a United States military program for the development and maintenance of tactical information exchange configuration items (CIs) and operational procedures. It was originated to ensure that the command and control (C2 and C3) and weapons systems of all US military services and NATO forces would be interoperable. MARCORSYSCOM Systems Engineering, Interoperability Architectures, and Technology direct the JINTACCS Program. Created as a non-acquisition R&D engineering program it provides for critical engineering services in several areas. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| JINTACCS is essential to USMC development and maintenance of tactical data exchange standards (Link 16, VMF, MTF, etc.), maintenance of C2 systems interoperability issues, development of Net Centric standards (XML, Web Services) to meet requirements of DoD/USMC Net Centric Data Strategy, and participation in Marine Corps, Joint, and Coalition Interoperability Certification testing to DoD/JCS/USMC/ NATO requirements in an ever-changing cyber environment. Requirements annotated in IT Budget Submit (NC-36). Increased involvement with the Army Marine Corps Board (AMCB, 3 Star Charter)), NATO Coalition Interoperability Assurance and Validation (CIAV) and Cross Domain Solution (CDS) certification.<br><br>***FY 2016 Accomplishments:***<br>-Initiated development of a NATO Coalition architecture to engineer interoperability of battalion and below forces to potentially expand the use of the STANAG in a Federated Mission Network (FMN)/Mission Partner Environment (MPE).<br>-Continued leading Joint Services development in the adoption of the National Information Exchange Model (NIEM) by performing the refactoring of Mil Std 6040 USMTF-XML to conform to the NIEM XML syntax and technical framework and engineering the XML translation of the Mil Std 6017 Variable Message Format (VMF) binary to XML message exchange for seamless, lossless C2 tactical data exchanges in net centric operations<br>-Continued NATO Data Management Capability Team (DM CaT). USMC supported the U.S. Head of Delegation (JCS J6) contributing to the development of the NATO Core Data Framework (NCDF) Overarching, Syntax, and Semantics Concept Papers.<br>-Continued Data engineering review of change requests on NIEM/MILOPS Domain data. The MILOPS Domain will provide a repository of reusable data components for standardization of information exchanges that meet Marine Corps IERs in a net-centric environment.<br>-Continued to coordinate NATO interoperability through as the USMC lead for the Coalition Interoperability Assurance<br>and Validation (CIAV) Working Group to identify and assess interoperability issues from current theaters of operations. A new coalition battle lab network (CFBLNET) connection was installed at MCTSSA to enable remote coalition testing and exercise participation.<br><br>***FY 2017 Plans:***<br>-Continue to review and update all IT Standards applicable to the USMC and maintain the architectural data environment to ensure all developed solution architectures are associated with the appropriate technical IT standards in their DoDAF Standards View. Continue to lead the Army - Marine Corps C2 interoperability Systems Engineering IPT to align the use of tactical messaging standards to create interoperability between the | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| DoD ground force systems FBCB2/JTCW (VMF), GCCS (OTH Gold), TBMCS/AFATDS (USMTF), and aviation tactical data links (Link 16/22).<br>-Continue to lead the USMC involvement in NATO forums to ensure USMC tactical C2 systems remain interoperable.<br>-Continue to participate in the development and maintenance of STANAG 4677 and associated architectures to expand interoperability to forces at battalion and below.<br>-Continue the develop and test the implementation of a Multi-Media Gateway (MMG) solution to bridge existing voice, video, and data network standards across tactical and garrison C2 networks through the continued engineering and certification of tactical cross-domain solutions.<br>-Continue to engineer and architect garrison and tactical network standards to continue the MCEN Cyber Vulnerability assessment and support the risk reduction activities to integrate tactical network data exchanges into a Cyber Common Operational Picture to support MARFORCYBER, MCNOSC, and HQMC C4 initiatives through the continued development of MCEN architectures.<br>-Continue implementation of Military Standards for VMF-XML and MTF-XML providing standardized translations of tactical data for seamless, lossless C2 information sharing in net centric operations. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue to review and update all IT Standards applicable to the USMC and maintain the architectural data environment to ensure all developed solution architectures are associated with the appropriate technical IT standards in their DoDAF Standards View.<br>-Continue to lead the Army - Marine Corps C2 interoperability Systems Engineering IPT to align the use of tactical messaging standards to create interoperability between the DoD ground force systems FBCB2/JTCW (VMF), GCCS (OTH Gold), TBMCS/AFATDS (USMTF), and aviation tactical data links (Link 16/22).<br>-Continue to lead the USMC involvement in NATO forums to ensure USMC tactical C2 systems remain interoperable.<br>-Continue to participate in the development and maintenance of STANAG 4677 and associated architectures to expand interoperability to forces at battalion and below.<br>-Continue to develop and test the implementation of a Multi-Media Gateway (MMG) solution to bridge existing voice, video, and data network standards across tactical and garrison C2 networks through the continued engineering and certification of tactical cross-domain solutions.<br>-Continue to engineer and architect garrison and tactical network standards to continue the MCEN Cyber Vulnerability assessment and support the risk reduction activities to integrate tactical network data exchanges | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| into a Cyber Common Operational Picture to support MARFORCYBER, MCNOSC, and HQMC C4 initiatives through the continued development of MCEN architectures.<br>-Continue implementation of Military Standards for VMF-XML and MTF-XML providing standardized translations of tactical data for seamless, lossless C2 information sharing in net centric operations.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SEIC: Engineering and Technical Support | 2.135 | 1.947 | 1.973 | 0.000 | 1.973 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Completed Systems Operational Verifications Tests (SOVT) and System of Systems Operational Tests (SOT) on 5 CANES ships (3 LHDs and 2 LSDs). These tests verified that CANES aboard these ships were properly configured to allow embarking MAGTFs to establish their afloat C4I network and implement essential, enterprise services in support of Global Force Management Plan (GFMP) deployments.<br>- Completed 7 Deployed Group Systems Integration Test (DGSIT) events to integrate MAGTF and USN afloat C2/C4 systems for 11th, 13th, 22nd, 24th and 31st MEUs.<br>- Completed technical review for the development of the 2016 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter, as well as being the principal author of 2 of 6 Enclosures.<br>- Completed changes/updates to two Engineer Change Requests (ECRs) with PEO C4I, PMW-160, which implemented fleet-wide improvements to Navy/Marine Corps Quality of Service (QoS) afloat.<br>- Continued engineering and technical support to the development (CD&I, CDD, C2/CEWID) of the USMC brief and service position for the JCS J6 led, Joint C2 Integration Workshop for Enterprise Common Operational Picture (ECOP) and Global Command & Control System - Joint (GCCS-J) modernization.<br>- Completed five POM issues for Blue-In-Support-Of-Green (BISOG) programs.<br>- Completed analyses for MAGTF Command Element, Ground Combat Element, and Aviation Combat Element command and control systems and weapons platform integration and interoperability.<br>- Completed individual Integration Analysis plans for each MAGTF element; only USMC documents to view USMC C2 integration and interoperability from a systems of systems perspective.<br>- Completed identifying integration and interoperability gaps, overlaps, and opportunities for investment.<br>- Continued serving as the Marine Corps Service Lead to the Missile Defense Agency-led Joint Systems Engineering Team (JSET) Increment I efforts. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2277 / *System Engineering and Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Coordinated with PEO IWS and other Services for development of joint service positions for interoperability initiatives.<br>- Represented Marine Corps and Naval equities for Joint Track Management Capability - including Link 16 and CEC - initiatives.<br>- Continued Link 16 and Variable Message Format (VMF) subject matter expertise to MCSC and PEO LS programs.<br>- Initiated operational and technical representation to the Marine Corps Technical Interoperability Standards Working Group. Provided USMC operational and systems of systems perspectives to proposed Link 16, VMF, XML, MILOPS, and Air Operations COI interface change proposals.<br>- Conducted iSMART feasibility to determine methodology for implementation across MCSC and PEO LS programs.<br>- Completed an Identification, Friend or Foe (IFF) DOTMLPF analysis for Marine Corps air command and control systems' implementation of Mode 5, Mode S, and ADS-B.<br>- Initiated and completed software licenses and training programs for configuration management toolset.<br>- Completed the data management and review of engineering competency policy.<br>- Completed a draft design documentation guidebook.<br>- Completed an acquisition system engineering division knowledge management portal. | | | | | |
| ***FY 2017 Plans:***<br>- Initiate technical and engineering support to the development of the 2017 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter.<br>- Continue to contribute to the OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG) program development.<br>- Initiate engineering support and development of USMC input to OUSD AT&L's Joint C2 Capability Area FY18/19 Sustainment & Modernization Plan and JCS J-6 Joint C2 Integration Workshops.<br>- Initiate integration of MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in support of 11th, 13th, 22nd, 26th and 31st MEU deployments via DGSIT.<br>- Conduct integration testing with PEO C4I & SPAWAR to integrate MCEN Services and MAGTF C2 Systems into the Navy's CANES environment aboard the LPD-17 class amphibious assault ships.<br>- Continue assessments of the GCTV portfolio in support of the FY18 GCTV Strategy Update.<br>- Continue follow-on activities to C-IED Detection Capability Analysis of Alternatives including assessments for the<br>development of a Capability Development Document (CDD). | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2277 / *System Engineering and Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue to baseline and assess options to address gaps within the Information Exchange Capabilities of the MAGTF.<br>- Continue analyses of MAGTF Command Element C2 integration and analyses.<br>- Continue as Marine Corps Service Lead for JSET Increment 2 (combat identification/air defense planning tools) analyses.<br>- Continue Link 16 and VMF support to MCSC and PEO LS program offices.<br>- Continue serving as the Marine Corps Unit Reference Number (URN) Manager.<br>- Initiate and oversee iSMART implementation strategy in MCSC and PEO LS.<br>- Initiate effect of unassociated target (UAT) messages on air situational awareness for MAGTF aviation command and control systems.<br>- Initiate command wide training for CM toolsets.<br>- Initiate competency release guidebook for design documentation.<br>- Continue knowledge management portal SIAT-wide.<br>- Continue data and configuration management of divisional products.<br>***FY 2018 Base Plans:***<br>- Initiate technical and engineering support to the development of the 2018 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter.<br>- Continue to contribute to the OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG) program development.<br>- Continue engineering support to the development of USMC input to OUSD AT&L's Joint C2 Capability Area FY18/19 Sustainment & Modernization Plan and Plan Build Workshop<br>- Initiate integration MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in support of 11th, 13th, 22nd, 26th and 31st MEU deployments via DGSIT.<br>- Initiate integration testing with PEO C4I & SPAWAR to integrate MCEN Services and MAGTF C2 Systems into the Navy's CANES environment aboard the LPD-17 class amphibious assault ships.<br>- Continue to baseline and assess options to address gaps within the Information Exchange Capabilities of the MAGTF.<br>- Continue to manage and expand the Engineering Knowledge Management system to provide consumer focused support to the engineering competency in a configuration controlled electronic library system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Public Affairs System (PAS): Product Development | 0.285 | 0.091 | 0.093 | 0.000 | 0.093 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2277 / *System Engineering and Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Initiated research and evaluation of solutions to modernize the Public Affairs Content Creation System (PACCS) to identify a lower cost handheld device with the capability to acquire, edit and transmit still and video imagery and engage publics via traditional and social media. These actions include the evaluation of device solutions, development of specific software applications, and the attainment of required information assurance certifications and accreditations for a handheld Public Affairs System.<br>***FY 2017 Plans:***<br>- Initiate support to the research and evaluation of solutions to modernize the Public Affairs Live Media Engagement System (PALMES) with the capability to transmit imagery and engage publics via traditional and social media via Military Satellite Communications (MILSATCOM). These actions will include the evaluation of device solutions and research of information assurance requirements to accredit the Public Affairs transmission capability.<br>***FY 2018 Base Plans:***<br>- Continue the research and evaluation of solutions to modernize the Public Affairs Live Media Engagement System (PALMES) with the capability to transmit imagery and engage publics via traditional and social media via Military Satellite Communications (MILSATCOM). These actions will include the evaluation of device solutions and research of information assurance requirements to accredit the Public Affairs transmission capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** MARCIMS: Marine Civil Information Management System | 0.050 | 0.066 | 0.422 | 0.000 | 0.422 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed participation in the North Atlantic Treaty Organization's Coalition Warrior Interoperability Exploration, Experimentation, Examination, Exercise 2016 (CWIX16), where MARCIMS achieved successful interoperability goals with a German Civil Information Management System.<br>-Completed participation in the Joint Civil Information Management System (JCIMS) working group to establish a way forward for a joint solution for civil information management and civil military operations.<br>-Completed providing map data to the National Geospatial Agency (NGA) for incorporation into their Map of the World project. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2277 / *System Engineering and Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiated transmission of MARCIMS map data from the low side to the high side using a data diode, allowing for one-way communication of data to be used by systems with a higher classification level during CWIX16.<br>-Initiated a more user friendly features that simplify the process for product development, information dissemination, and data analysis.<br>-Procured four test devices to identify final device for tech refresh in FY17.<br>***FY 2017 Plans:***<br>-Continue modernization effort to replace aging equipment that is no longer supported by the manufacturer due to changes in business policies and practices.<br>-Initiate participation in CWIX17, with a more robust interoperability goal to automate, disseminate, and incorporate civil information across multiple systems within the NATO coalition framework.<br>-Initiate integration of the Public Affairs System (PAS) newly created hub into the existing MARCIMS cloud architecture.<br>***FY 2018 Base Plans:***<br>-Continue the expansion of cloud services to accommodate additional users across the coalition (NATO, etc.) and other government agencies (NGA, etc.), and the joint service (Army Reserves)<br>-Continue maintaining existing MARCIMS database and architecture.<br>-Initiate development required for the MARCIMS 2.0 implementation and Marine Corps Force (MCF) 2025. This accounts for the funding increase of $356k from FY17 to FY18.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Military Information Support Operations (MISO)<br>***Articles:***<br><br>***Description:*** The MISO Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. Funds increase from FY17 to FY18 initiates product development of the Fly-Away Broadcast System (FABS) in preparation for a MS B decision.<br>***FY 2016 Accomplishments:*** | 0.000<br>- | 0.000<br>- | 3.055<br>- | 0.000<br>- | 3.055<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2277 / *System Engineering and Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Initiate product development of the Fly-Away Broadcast System (FABS) in preparation for a MS B decision.<br>- Complete a production design of the FABS<br>- Validate FABS production requirements<br>- Manage FABS technical risk<br>- Update cost estimates<br>- Define system support requirements<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.013 | 4.861 | 8.314 | 0.000 | 8.314 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4620a: *MARCIMS* | 0.248 | 0.297 | 0.235 | - | 0.235 | 0.221 | 0.225 | 0.230 | 0.235 | Continuing | Continuing |
| • PMC/4620b: *Public Affairs Systems* | 1.163 | 0.893 | 1.713 | 0.200 | 1.913 | 0.682 | 0.690 | 0.708 | 0.722 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

MARCIMS will continue to support and sustain the current baseline system, while employing incremental changes to ensure that the system not only meets current requirements per the Letter of Clarification, but also allows for a more user friendly system. MARCIMS plans to begin development of MARCIMS 2.0 in a partnership with ONR, while simultaneously maintaining the current and approved version of the system.

Public Affairs System will maximize the utilization of commercial-off-the-shelf devices and software to provide best overall performance solutions to the warfighter with minimal developmental cost and schedule investments.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>*2277 / System Engineering and Integration* |

MISO will complete a production design of the FABS, validate production requirements, manage FABS technical risk and define system support requirements in FY18, leading to a MS B decision in Q2 FY18, MS C decision in Q3 FY19, and an FRP decision in Q2 FY20.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2278 / *Air Defense Weapons System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2278: *Air Defense Weapons System* | 44.734 | 1.635 | 35.009 | 24.214 | - | 24.214 | 6.237 | 6.081 | 6.074 | 6.065 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

New sub-title: Ground Based Air Defense-Stinger Sustainment (GBAD-SS) efforts were titled GBAD-Transformation in PB17.

**A. Mission Description and Budget Item Justification**

Ground Based Air Defense-Stinger Sustainment (GBAD-SS) - Based upon the deployment of the Low Altitude Air Defense (LAAD) Battalions and their employment of the Stinger Missile, GBAD-SS transforms Air Defense equipment through technology insertion and equipment repackaging to address capability gaps as the result of equipment obsolescence and the emergent and evolving threats to the Marine Air Ground Task Force (MAGTF). GBAD-SS consists of four efforts: 1) systems engineering support of currently fielded LAAD equipment/assets to include the Stinger Mounted Optic and Mode 5/S Identification Friend or Foe (IFF); 2) redesign and integration of the Advanced Man-Portable Air Defense System (A-MANPADS) Increment 1 Fire Unit Vehicle (FUV) which consists of a M1114 (HMMWV), into an operationally capable vehicle configuration; 3) design, test, and integration of new systems for the Fire Unit Vehicle (FUV) to replace aging and failing technology. The replacement technology is required to retain interfaces with, and be capable of receiving, a Common Aviation Command and Control System (CAC2S) broadcasted link. It will also be capable of interfacing with legacy Marine Air Command and Control System (MACCS) equipment; 4) Redesign and re-integration of Section Leader Vehicle (SLV) equipment from the shelter on a M1165 configuration to M1114 configuration, providing a common platform with greater mobility, force protection and maneuverability increasing overall operational capability.

GBAD Future Weapons System (GBAD-FWS) is a development effort consisting of a kinetic and non-kinetic capability to defeat the full spectrum of Low-Altitude Low Observable/Low Radar Cross Section threats. The budget reflects the GBAD Future Weapons System and the Commandant of the Marine Corps (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission to include C-UAS. Efforts will include assessment, engineering analysis and prototype procurement necessary to evaluate various direct energy, electronic attack, projectile, and missile capabilities to determine the right mix of technologies required to negate aerial threats and provide the MAGTF, as well as, Bases, Posts and Stations, force protection against such threats. With the proliferation of both military and commercial UAS platforms, the program will pursue and acquire a GBAD-FWS platform with a C-UAS capability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** GBAD STINGER SUSTAINMENT: Product Development | 0.827 | 1.016 | 1.420 | 0.000 | 1.420 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** The increase in funding from FY17 to FY18 of $.404M supports the system engineering efforts associated with the Missile Mounted Optic (AN/PAS-18) replacement development and Mode 5 replacement development.<br><br>***FY 2016 Accomplishments:***<br>-Initiated Stinger Missile Mounted Optic (AN/PAS-18) replacement development.<br>***FY 2017 Plans:***<br>-Complete Section Leader Vehicle redesign and re-integration of Section Leader Vehicle equipment from the shelter on a M1165 configuration to M1114 configuration.<br>-Continue Stinger Missile Mounted Optic (AN/PAS-18) replacement development.<br>-Initiate Mode 5 replacement development.<br>***FY 2018 Base Plans:***<br>-Continue Stinger Missile Mounted Optic (AN/PAS-18) replacement development.<br>-Continue Mode 5 replacement development.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GBAD STINGER SUSTAINMENT: Support Costs | 0.403 | 0.364 | 0.462 | 0.000 | 0.462 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued development of both Stinger Missile Mounted Optic (AN/PAS-18) replacement and M1114 (HMMWV)/FUV Replacement documentation.<br>-Initiated an A-MANPADS Engineering Change Proposal (ECP) Readiness Analysis.<br>***FY 2017 Plans:***<br>-Continue A-MANPADS Engineering Change Proposal (ECP) Readiness Analysis.<br>***FY 2018 Base Plans:***<br>-Completes A-MANPADS Engineering Change Proposal (ECP) Readiness Analysis.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GBAD STINGER SUSTAINMENT: Test and Evaluation | 0.255 | 0.175 | 0.737 | 0.000 | 0.737 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The increase in funding from FY17 to FY18 of $0.562M supports the Mode 5 redesign and integration of the Advanced Man-Portable Air Defense System (A-MANPADS)<br><br>***FY 2016 Accomplishments:***<br>-Initiated support of Stinger Missile Mounted Optic (AN/PAS-18) replacement Developmental Test.<br><br>***FY 2017 Plans:***<br>-Continue Section Leader Vehicle redesign transportability testing.<br>-Initiate support of Mode 5 replacement preparations for Field User Evaluation (FUE).<br>-Initiate support of Stinger Missile Mounted Optic (AN/PAS-18) replacement Developmental Test and preparations for Operational Test/Field User Evaluation (OT/FUE).<br><br>***FY 2018 Base Plans:***<br>-Complete Stinger Missile Mounted Optic (AN/PAS-18) Field User Evaluation (FUE).<br>-Complete Mode 5 replacement Field User Evaluation (FUE).<br>-Complete Section Leader Vehicle redesign transportability testing.<br>-The increase in funding from FY17 to FY18 of $0.562M supports the Mode 5 redesign and integration of the Advanced Man-Portable Air Defense System (A-MANPADS)<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GBAD STINGER SUSTAINMENT: Program Management Support | 0.150 | 0.240 | 0.664 | 0.000 | 0.664 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The increase in funding from FY17 to FY18 of $0.424M supports the completion of the Stinger Identification Friend or Foe (IFF) replacement acquisition documentation efforts.<br><br>***FY 2016 Accomplishments:***<br>-Continue with Stinger Night Replacement acquisition documentation.<br>-Initiate development of acquisition documentation in support of Stinger Identification Friend or Foe (IFF) replacement system.<br><br>***FY 2017 Plans:***<br>-Complete Stinger Night Replacement acquisition documentation. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue development of acquisition documentation in support of Stinger Identification Friend or Foe (IFF) replacement system.<br>***FY 2018 Base Plans:***<br>-Complete development of acquisition documentation in support of Stinger Identification Friend or Foe (IFF) replacement system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GBAD FWS/COUNTER UAS Product Development<br>***Articles:*** | 0.000<br>- | 28.355<br>- | 18.069<br>- | 0.000<br>- | 18.069<br>- |
| ***Description:*** NOTE: The decrease of $10.286M from FY17 to FY18 reflects the Marine Corps assessment to address emergency war fighting requirements for a GBAD Future Weapons System and the Commandant of the Marine Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission to include C-UAS. Efforts will include assessment, engineering analysis and prototype procurement necessary to evaluate various direct energy, electronic attack, missile and projectile capabilities to determine the right mix of technologies required to negate aerial threats and provide the MAGTF, as well as, Bases, Posts and Stations, Force Protection against such threats. With the proliferation of both military and commercial UAS platforms, the program will pursue and acquire GBAD-FWS platforms with a C-UAS capability.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>-Initiation of prototype procurement, development, and operational assessment of the Man-Portable Anti-Drone Defeat System Kit (MADS-K). This system will be used to detect, track, identify, and neutralize the emergent small UAS threat.<br>-Initiation of CMC directed Counter UAS efforts to determine technology solutions required to defeat threats associated with the Marine Corps Low-Altitude Air Defense mission. Includes the procurement and integration of prototype systems and operational assessments. Systems will provide capabilities such as detect, track, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| identify, threat negation and lethal destruction, to include utilizing a slew-to-cue optic for a high energy laser engagement.<br>***FY 2018 Base Plans:***<br>-Continuation of GBAD Future Weapons System/Counter-UAS engineering and prototype development efforts to determine the technology solutions required to defeat the full spectrum of threats to include UAS's associated with the Marine Corps Low-Altitude Air Defense mission. Includes the procurement and integration of prototype systems and operational assessments. Systems will provide capabilities such as detect, track, identify, threat negation and lethal destruction, to include utilizing a slew-to-cue optic for a high energy laser engagement.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** GBAD FWS/COUNTER UAS: Support Costs<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>-Initiation of systems engineering and training for the Man-Portable Anti-Drone System Kit (MADS-K) development.<br>-Initiation of CMC directed Counter UAS efforts to determine technology solutions required to defeat threats associated with the Marine Corps Low-Altitude Air Defense mission. Includes systems engineering, safety review boards, prototype system maintenance, support and training.<br>***FY 2018 Base Plans:***<br>-Continuation of GBAD Future Weapons System and Counter UAS acquisition, engineering, and assessment efforts to determine the technology solutions required to defeat UAS threats associated with the Marine Corps Low-Altitude Air Defense mission. Includes systems engineering, safety review boards, prototype system maintenance, support and training.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 3.095<br>- | 1.660<br>- | 0.000<br>- | 1.660<br>- |
| ***Title:*** GBAD FWS/COUNTER UAS: Program Management Support<br>***Articles:*** | 0.000<br>- | 1.764<br>- | 1.202<br>- | 0.000<br>- | 1.202<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>-Initiation of GBAD Future Weapons System and Counter UAS acquisition documentation and assessment efforts to determine the technology solutions required to defeat the full spectrum or threats associated with the Marine Corps Low-Altitude Air Defense mission.<br>***FY 2018 Base Plans:***<br>-Continuation of GBAD Future Weapons System and Counter UAS acquisition documentation and assessment efforts to determine the technology solutions required to defeat the full spectrum or threats associated with the Marine Corps Low-Altitude Air Defense mission.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.635 | 35.009 | 24.214 | 0.000 | 24.214 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/3006: *GBAD-SS* | 6.642 | 9.170 | 9.432 | - | 9.432 | 15.922 | 16.501 | 16.825 | 15.513 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

GBAD-Stinger Sustainment: A-MANPADS Increment I is an Abbreviated Acquisition Program (AAP), GBAD-SS enables the rapid transition from the Avenger/MANPADS weapon system to the more mobile, flexible and maintainable Advanced MANPADS. The AAP is principally comprised of integrating Government Off The Shelf (GOTS) equipment and Non-Developmental Items (NDI).

GBAD Future Weapons System: The GBAD Program is rapidly approaching the out of production phase for the A-MANPADS Increment I and the end of life for the Stinger missile. The Stinger missile is a reliable but older technology. Consequently, the GBAD Program is planning for a GBAD Future Weapon System to replace the Stinger missile and the weapon system platform. The GBAD Future Weapon System will require an update to the Analysis of Alternatives (AoA) and a Material Development Decision, followed by the development and approval of a Capability Development Document (CDD). The GBAD Future Weapon System may consist of a multiple weapons system platforms to defeat current and emerging threats for UAS, FW/RW aircraft, and cruise missiles.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBAD-SS | WR | NSWC : Dahlgren, VA | 0.467 | 0.230 | Feb 2016 | 0.110 | Dec 2016 | 0.356 | Oct 2017 | - | | 0.356 | Continuing | Continuing | Continuing |
| GBAD-SS | WR | NSWC : Crane.IN | 4.590 | 0.000 | | 0.411 | Dec 2016 | 0.421 | Nov 2017 | - | | 0.421 | Continuing | Continuing | Continuing |
| GBAD-SS | Various | VARIOUS : VARIOUS | 6.268 | 0.597 | Jul 2016 | 0.495 | Jul 2017 | 0.643 | Mar 2018 | - | | 0.643 | Continuing | Continuing | Continuing |
| GBAD FWS/Counter UAS | MIPR | CTTSO : Washington, DC | 0.000 | 0.000 | | 14.265 | Jun 2017 | 1.528 | Jan 2018 | - | | 1.528 | 0.000 | 15.793 | - |
| GBAD FWS/Counter UAS | MIPR | DOTC : Picatinny, NJ | 0.000 | 0.000 | | 14.090 | Jun 2017 | 16.541 | Feb 2018 | - | | 16.541 | 0.000 | 30.631 | - |
| Prior Years Cumulative Funding | Various | N/A : N/A | 15.932 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 15.932 | - |
| | | **Subtotal** | 27.257 | 0.827 | | 29.371 | | 19.489 | | - | | 19.489 | - | - | - |

**Remarks**

GBAD SS - Increase in funding from FY17 to FY18 of $.404M supports the system engineering efforts associated with the Missile Mounted Optic (AN/PAS-18) replacement development and Mode 5 replacement development.
C-UAS CTTSO - Decrease in funding of $12.737M from FY17 to FY18 reflects the FY17 C-UAS efforts executed in support of the Marine Corps addressing emergent war fighting requirements for a GBAD Future Weapons System with a C-UAS capability, including the procurement of MADS-K systems. Funding supports continued engineering and prototyping efforts with the Man-Portable Anti-Drone Defeat System Kit (MADS-K) systems.
C-UAS DOTC - Increase in funding from FY17 to FY18 of $2.451M supports continued GBAD Future Weapons System/Counter-UAS engineering and prototyping efforts.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBAD-SS | WR | NSWC : Crane, IN | 2.241 | 0.403 | Nov 2015 | 0.364 | Dec 2016 | 0.366 | Jan 2018 | - | | 0.366 | Continuing | Continuing | Continuing |
| GBAD-SS | Various | VARIOUS : VARIOUS | 0.000 | 0.000 | | 0.000 | | 0.096 | Dec 2017 | - | | 0.096 | 0.000 | 0.096 | - |
| GBAD FWS/Counter UAS | Various | NWCS : Dahlgren | 0.000 | 0.000 | | 3.095 | Apr 2017 | 1.660 | Dec 2017 | - | | 1.660 | 0.000 | 4.755 | - |
| Prior Years Cumulative Funding | Various | N/A : N/A | 4.388 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.388 | - |
| | | **Subtotal** | 6.629 | 0.403 | | 3.459 | | 2.122 | | - | | 2.122 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2278 / *Air Defense Weapons System* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBAD-SS | MIPR | NSWC Crane : Crane, IN | 0.940 | 0.164 | Jan 2016 | 0.175 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| GBAD-SS | MIPR | ARMY : VARIOUS | 0.000 | 0.000 | | 0.000 | | 0.737 | Mar 2018 | - | | 0.737 | 0.000 | 0.737 | - |
| Prior Years Cumulative Funding | Various | N/A : N/A | 4.994 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.994 | - |
| | | **Subtotal** | 5.934 | 0.164 | | 0.175 | | 0.737 | | - | | 0.737 | - | - | - |

**Remarks**

-Overall T&E funding increase ($0.562M) from FY17 to FY18 supports both the Mode 5 IFF redesign and integration of the Advanced Man-Portable Air Defense System (A-MANPADS).

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GBAD-SS | C/FP | MCSC : Quantico, VA | 2.965 | 0.000 | | 0.050 | Jul 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| GBAD-SS | Various | MCSC Travel : Quantico, VA | 0.122 | 0.076 | Sep 2016 | 0.100 | Sep 2017 | 0.098 | Sep 2018 | - | | 0.098 | Continuing | Continuing | Continuing |
| GBAD-SS | WR | NSWC : Dahlgren, VA | 0.509 | 0.165 | Oct 2015 | 0.090 | Jan 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| GBAD-SS | C/FP | Alexandria Insights : Quantico, VA | 0.000 | 0.000 | | 0.000 | | 0.566 | Dec 2017 | - | | 0.566 | 0.000 | 0.566 | - |
| GBAD FWS/COUNTER UAS | Various | VARIOUS : VARIOUS | 0.000 | 0.000 | | 1.764 | Jan 2017 | 1.202 | Dec 2017 | - | | 1.202 | 0.000 | 2.966 | - |
| Prior Years Cumulative Funding | Various | N/A : N/A | 1.318 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.318 | - |
| | | **Subtotal** | 4.914 | 0.241 | | 2.004 | | 1.866 | | - | | 1.866 | - | - | - |

**Remarks**

-Alexandria Insights funding increases ($0.566M) from FY17 to FY18 provides dedicated support necessary to complete acquisition documentation for Stinger Identification, Friend or Foe (IFF) replacement efforts.

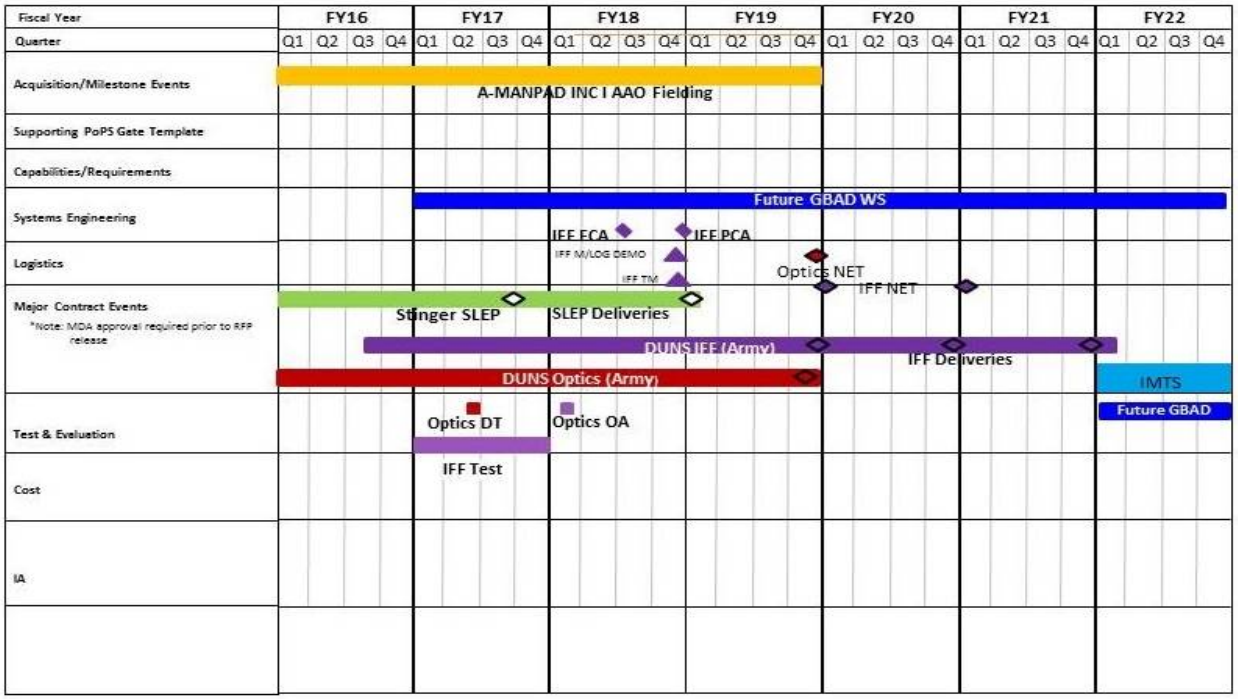
| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>2278 / *Air Defense Weapons System* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 44.734 | 1.635 | | 35.009 | | 24.214 | | - | | 24.214 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

# GBAD Integrated Program Plan



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2278 / *Air Defense Weapons System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***GBAD-T*** | | | | |
| STINGER SLEP: STINGER SLEP DELIVERY | 4 | 2017 | 4 | 2018 |
| AMANPADS: AMANDPADS INC 1 FIELDING | 2 | 2016 | 4 | 2019 |
| OPTICS: OPTICS OT/FUE (OPERATIONAL TEST/FIELD USER EVALUATION) | 1 | 2018 | 1 | 2018 |
| OPTICS: OPTICS DELIVERY | 1 | 2019 | 1 | 2020 |
| IFF: IFF OT/FUE | 1 | 2019 | 1 | 2019 |
| IFF: IFF DELIVERIES | 4 | 2019 | 4 | 2021 |
| GBAD FUTURE WEAPONS SYSTEM: GBAD FUTURE WEAPONS SYSTEM | 1 | 2017 | 4 | 2022 |
| IMTS PROCUREMENT: IMTS PROCUREMENT | 1 | 2022 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | Date: May 2017 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | | | | Project (Number/Name)<br>2510 / *MAGTF CSSE & SE* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2510: *MAGTF CSSE & SE* | 281.492 | 13.040 | 2.345 | 1.518 | - | 1.518 | 1.340 | 1.369 | 1.488 | 1.508 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

ELECTRONIC MAINTENANCE SUPPORT SYSTEM (EMSS): Re-named MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) beginning in FY16.
TRANSPORTATION SYSTEMS PORTFOLIO (TSP): Re-named Enterprise Logistics Support Systems (ELSS) beginning in FY16.

**A. Mission Description and Budget Item Justification**

(U) The Marine Air Ground Task Force (MAGTF) Combat Service Support Element & Supporting Establishment (CSSE & SE) consists of mutually supporting Logistics Information Technology (IT) programs that support force deployment, planning, and execution; sustainment and distribution; and contributes to the Combatant Commander's Common Operating Picture to support rapid accurate decision making.

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS/ Logistics Chain Management (GCSS-MC/LCM) ) family of systems (FoS) serves as primary technology enabler for the Marine Corps Logistics Modernization strategy. GCSS-MC/LCM provides the backbone for all logistics information required by the Marine Forces and the Supporting Establishment. The core for GCSS-MC/LCM Increment 1 is a modern, commercial-off-the-shelf enterprise resource planning software (Oracle e-Business Suite). The Increment 1 design focused on enabling the warfighter to operate while deployed with reach back from the battlefield. Increment 1 replaced 5 legacy supply and maintenance information technology systems and currently supports ~22,000 users world-wide. The focus of future functions will be enhancing capabilities in the areas of warehousing, distribution, logistics planning, decision support, depot maintenance, and integration with emerging technologies to improve asset visibility.The Tactical-Warehouse Management System (T-WMS) capability development is support by these funds.in GCSS-MC, RDTE PE 0206313M, project 2510 will transition to PE 0219902M Project C5503 commencing in FY2017.

JOINT FORCE REQUIREMENTS GENERATOR II (JFRG II)) is an Automated Information System (AIS) that provides the Marine Corps' the capability to plan and execute strategic force deployments in support of Joint contingency and crisis action operations and plans. It serves as the single link between Service operational force requirements and validated/sourced unit personnel and cargo data. JFRG II permits multi-level planning with entry of equipment and personnel data, transportation/ movement data, and the phasing of the total force throughout the entire movement timeline. JFRG II interfaces with the Joint Operation Planning and Execution System (JOPES) to register update and validate Time Phased Force and Deployment Data (TPFDD) within the Department of Defense chain of command. Validated deployment information is then used by U.S. Transportation Command for the scheduling of strategic transportation assets. JFRG II interfaces with the MAGTF Deployment Support System II (MDSS II) for unit cargo information and the War Reserve System (WRS) in order to register sustainment requirements. JFRG II can generate standard, executive, and ad hoc reports and perform database queries to support information requirements. JFRG II operates and functions in a classified environment.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network communications infrastructure that connects the end-user to the Defense Information Systems Agency (DISA) network. BTI sustains upgrades and enhances the telecommunications systems infrastructure for all Marine Corps Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF). BTI

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

is designed to maintain industry currency as it relates to technological capabilities for all voice, video and data transport services via each installation's infrastructure. These data services include support for, but are not limited to: telephony (including voice over internet protocol), video-teleconferencing, integrated services digital network, Marine Corps enterprise network, energy monitoring control systems, intrusion detection systems, access control systems, fire alarm control networks and fleet training systems. This includes supporting systems such as optical networks, telecommunications management systems, primary power, voice mail and teleconferencing.

ENTERPRISE LOGISTICS SUPPORT SYSTEMS (ELS2): Provides funding that supports the USMC Deployment and Execution Support Systems and the Distribution Management Support Systems, and fair share cost to the joint program management office systems. These systems and applications support the planning, deployment, distribution, sustainment and redeployment of supplies, equipment and personnel. The ELS2 applications utilize Automated Information Technology (AIT) read/write devices, active radio frequency identification (aRFID) tags and satellite tracking systems. ELS2 applications support In-Transit Visibility (ITV) and Total Asset Visibility (TAV) initiatives to provide commanders with timely and accurate near real-time data on the location and movement of personnel, equipment and supplies that are in-process, in-transit and in-theater. This developmental effort completed in FY17 and requires no FY18 funding.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2): Composed of several main components including Electronic Maintenance Devices (EMD). It is a rugged organizational-level (O-level), light-weight, one-man portable maintenance device capable of supporting multiple platforms and systems across maintenance communities. It provides a Commercial Off-The-Shelf (COTS) hardware device equipped with Built-In-Test/Built-In-Test Equipment (BIT/BITE) interfaces, and Software Defined Test Instrument (SDTI) General Purpose Electronic Test Equipment (GPETE) capabilities. These hardware capabilities will enable commercial or custom DoD and USMC software capabilities including Interactive Electronic Technical Manuals (IETMs), Computer Based Training (CBT), and other maintenance applications to be hosted on EMD platforms. EMSS also has the capability to connect to the Marine Corps Enterprise Network (MCEN) and access sites like Global Combat Support System - Marine Corps (GCSS-MC) in order to facilitate maintenance and supply transactions. With these capabilities, maintainers will make more informed decisions, thereby sustaining force readiness over time. The increase in funding from FY17 to FY18 of $267K continues technical support towards wireless connectivity of host application to maintenance platform tools for the following MOSs: AAV mechanics, Ordnance mechanics, Motor-T mechanics, and LAV mechanics.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** JOINT FORCES REQUIREMENT GENERATION II (JFRG II) | 1.310 | 0.202 | 0.206 | 0.000 | 0.206 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed Development, Testing, Information Security and Interoperability testing/certification<br>-Completed deployment of the Information System and began transition to Post Deployment Software Support (PDSS). | | | | | |
| ***FY 2017 Plans:***<br>-Initiate, Conduct, and support Government Acceptance Testing. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate Engineering Change Proposals (ECPs).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** BASE TELECOM (BTI) | 0.271 | 0.490 | 0.500 | 0.000 | 0.500 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued test and evaluation (T&E) engineering support for Defense Information Systems Agency (DISA) Unified Capabilities (UC) (voice, video, collaboration, and data) implementation.<br>***FY 2017 Plans:***<br>Continue test and evaluation (T&E) engineering support for Defense Information Systems Agency (DISA) Unified Capabilities (UC) (voice, video, collaboration, and data) implementation.<br>***FY 2018 Base Plans:***<br>Continue test and evaluation (T&E) engineering support for Defense Information Systems Agency (DISA) Unified Capabilities (UC) (voice, video, collaboration, and data) implementation.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Global Combat Suport Systems-Marine Corps | 9.163 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued development of the GCSS-MC/LCM Increment 1 baseline upgrade from Oracle eBusiness Suite Release 11i to R12<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** ENTERPRISE LOGISTICS SUPPORT SYSTEMS (ELS2) | 1.678 | 1.112 | 0.000 | 0.000 | 0.000 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Initiated subsequent increment of ICODES SSDM development as necessary and continue functional testing and validation.<br>***FY 2017 Plans:***<br>Initiate third increment of SSDM for Maritime Repositioning Force (MPF) operations.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) | 0.618 | 0.541 | 0.812 | 0.000 | 0.812 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed investigation of software defined test instruments (SDTI) and software applications.<br>-Completed investigation of advanced Interactive Electronic Technical Manual software to incorporate advanced diagnostics.<br>-Completed information security and interoperability testing/certification.<br>-Completed software applications which support enhanced maintenance capabilities on existing weapon system platforms.<br>***FY 2017 Plans:***<br>-Continue to investigate software defined test instruments (SDTI) and software applications.<br>-Continue to investigate advanced Interactive Electronic Technical Manual software to incorporate advanced diagnostics.<br>-Continue information security and interoperability testing/certification.<br>-Continue software applications which support enhanced maintenance capabilities on existing weapon system platforms.<br>-Initiate efforts to evaluate downsized testers for tablet applications.<br>-Initiate efforts to investigate instrument modules for on system testing.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate efforts to investigate software defined test instruments (SDTI) and software applications for the Health Management System (formerly called Next Generation Operation Management Systems).<br>-Initiate efforts to develop Wireless Access Module (WAM) of host application to maintenance platform tools for the following MOSs: AAV mechanics, Ordnance mechanics, Motor-T mechanics and LAV mechanics.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.040 | 2.345 | 1.518 | 0.000 | 1.518 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/BLI 463500 BTI: *BTI* | 42.372 | 22.964 | 38.493 | - | 38.493 | 65.074 | 49.012 | 66.451 | 81.063 | Continuing | Continuing |
| • PMC/BLI 418100: *MAGTF Logistics Support Systems* | 3.570 | 3.829 | 11.263 | - | 11.263 | 12.321 | 12.421 | 12.474 | 7.692 | Continuing | Continuing |
| • PMC/BLI 461700: *TSP/Enterprise Logistics Support Systems* | 0.392 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/BLI 462000: *TSP/Enterprise Logistics Support Systems* | 0.000 | 0.594 | 0.253 | - | 0.253 | 0.259 | 0.264 | 0.269 | 0.275 | Continuing | Continuing |
| • PMC/4616: *GCSS-MC* | 0.000 | 1.089 | 1.990 | - | 1.990 | 9.594 | 9.205 | 1.230 | 1.256 | Continuing | Continuing |
| • PMC/4617: *Combat Support Systems* | 0.392 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 63.324 |
| • RDTE/0219902M: *GCSS-MC* | 0.000 | 9.128 | 4.476 | - | 4.476 | 2.695 | 0.000 | 0.000 | 0.000 | 0.000 | 16.299 |

**Remarks**

**D. Acquisition Strategy**

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS/LOGISTICS CHAIN MANAGEMENT (GCSS-MC/LCM) The Acquisition Strategy for GCSS-MC/LCM Increment 1 and the documentation for the GCSS-MC/LCM capabilities is building an acquisition approach in the family of systems for Logistics Chain Management (LCM) that continues to modernizing Logistics Systems. The goal is to field operationally suitable and supportable capabilities in the shortest time possible that meets the logistics advocate goals. The GCSS-MC Program Management Office will deliver capabilities as defined in the DoDi 5000.02. Each sustaining capability will follow the acquisition model for software intensive systems. Increment 1 provided supply, maintenance, asset visibility, financial information and systems admin. Future sustaining capabilities first apply to warehousing.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

JOINT FORCES REQUIREMENT GENERATOR II (JFRG II) is required to modernize in order to implement Joint Requirements Oversight Counsel (JROC) mandates in support of Adaptive Planning and Execution (APEX) including the inclusion of Global Force Management - Data Initiative (GFM-DI) data elements and Joint Command and Control (JC2) Capabilities Development Document (CDD) requirements. The JFRG II legacy software application will remain supported until end of life (EOL) in FY17 when it will be replaced by the modernized version. Future capability improvements as identified in the JC2 CDD will be implemented through the configuration management process.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network communications infrastructure that connects the end-user to the DISA network. BTI sustains upgrades and enhances the telecommunications systems infrastructure for all Marine Corps Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF). Participation in the DISA Unified Capabilities (voice, video, collaboration, and data) pilot is critical to BTI modernization strategy. The RDT&E funds will be utilized for analysis, research and evaluation of Unified Capabilities (UC) (voice, video, collaboration, and data) implementation efforts.

ENTERPRISE LOGISTICS SUPPORT SYSTEM (ELS2): The acquisition strategy is to develop the functional elements of the MAGTF Deployment Support System II (MDSS II) into a Sea Service Deployment Module (SSDM) of the Integrated Computerized Deployment System (ICODES). ICODES is a Joint Program currently managed by the Surface Deployment and Distribution Command (SDDC) of USTRANSCOM. The development of the SSDM was instituted as a CLIN to the SDDC JPMO contract for ICODES awarded in December 2015. The development will follow an evolutionary acquisition approach that allows for continued development based on functional transition and changing user need requirements as well as information assurance requirements. The JPMO will determine the contracting strategy and this PMO will acknowledge and approve strategies prior to funding development.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) is pursuing an evolutionary acquisition strategy in order to sustain operationally suitable and supportable capability across the Marine Corps as a maintenance aid. Electronic Maintenance Devices must evolve in concert with the supported platforms maintenance philosophy to provide extended functionality and access to network connectivity.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>3099 / *Radar System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3099: *Radar System* | 184.963 | 3.972 | 13.423 | 14.015 | - | 14.015 | 22.378 | 17.130 | 16.718 | 18.032 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Long Range Radar (AN/TPS-59) - The AN/TPS-59A(V)3 is a transportable, three dimensional, tactical radar system that provides the Marine Air Ground Task Force (MAGTF) with long-range surveillance. It is the MAGTF's only ground based long range sensor that provides the capability to detect and report Air Breathing Targets (ABT) and track Theater Ballistic Missiles (TBM). The AN/TPS-59A(V)3 Radar System is connected to the AN/TSQ-269 Mobile - TAOM (M-TAOM) or the Common Aviation Command and Control Systems (CAC2S). It provides the air defense controllers data and may be used autonomously to conduct Ground Control Intercept, tactical en-route Air Traffic Control (ATC), or TBM alert operations via the Joint Integrated Air Missile Defense (IAMD) encrypted Link-16. The USMC extended the AN/TPS-59 service life through 2035; therefore, in order to maintain its operational relevance on the battlefield, a number of modernization efforts are initiated starting in FY17. The Digital Receiver and Exciter (DREX) upgrade will convert the analog receivers and exciters to digital to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, enable spectral agility, reduce noise, reduce false alarms, and enhance Electronic Counter-Countermeasures (ECCM) capability. This effort will include an essential simulation and test environment capability. The AN/TPS-59 radar has been continuously deployed in support of Operation Freedom Sentinel (OFS) and other contingencies.

Family of Target Acquisition Systems (FTAS) - The FTAS provides the MAGTF the capability to locate, identify, and attack enemy indirect fire weapons systems and observe and direct friendly artillery fire. The FTAS consists of the AN/TPQ-46 Firefinder Radar, the AN/TPQ-49 Lightweight Counter Mortar Radar, and the AN/TSQ-267 Target Processing Set. The FTAS is critical in the execution of counterfire and the integration of target acquisition information enabling attack by MAGTF assets. The FTAS also provides artillery firing units the ability to conduct artillery registration and other friendly fire missions. The FTAS encompasses the equipment required to support target acquisition within the target acquisition platoon and is resident in the headquarters battery of each artillery regiment. The program will continue to address system issues that arise due to DMSMS items within the FTAS. The USMC assumed the role of Primary Inventory Control Activity (PICA) for the AN/TPQ-49 in FY15 when the Army divested itself from the system.

Short/Medium Range Air Defense Radar (SHORAD or AN/TPS-63) - The AN/TPS-63 is a two-dimensional, medium-range, medium altitude, transportable radar system, which is doctrinally employed as a tactical gap-filler or as an early warning system for early deployment into the operational area. It has a 360-degree air surveillance capability at a range of 160 miles and complements the co-employed AN/TPS-59 three-dimensional, long-range, air surveillance radar system. The program will use Other Government Agencies (OGAs) to develop engineering change proposals related to DMSMS for improved system reliability with the specific purpose of meeting increased fleet operational requirements. This system will be replaced by Ground/Air Task Oriented Radar (G/ATOR AN/TPS-80).

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area. The VWC provides a venue for the exploration of advanced engagement concepts focused on persistent forward naval engagements in support of the MAGTF and the development of associated

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

Joint and Service specific tactics, techniques, and procedures (TTPs). VWC support encompasses a set of integrated fire control (IFC) activities that also includes concept/CONOPS development, family of systems architecture development, and systems engineering/integration efforts.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** AN/TPS-59 : Product Development | 0.086 | 7.229 | 6.628 | 0.000 | 6.628 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The decrease of $601K from FY17 to FY18 is a result of the decrease in product development that addresses DMSMS issues. Product development for Digital Receiver and Exciter (DREX) critical design increased during this same period, but overall it was a net decrease. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Continued Engineering Change Proposal (ECP) Developmental Studies to address DMSMS issues. | | | | | |
| ***FY 2017 Plans:***<br>-Completed Engineering Change Proposal (ECP) Developmental Studies to address DMSMS issues.<br>-Initiate product development for Digital Receiver and Exciter (DREX) with Electronic Counter-Counter Measure and Radar Environmental Simulator. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue product development for Digital Receiver and Exciter (DREX) which is critical to address congested spectral environment and enable all future enhancements to include Tactical Ballistic Missile (TBM).<br>-Initiate DREX Engineering Design Model (EDM). | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AN/TPS-59 : Support | 1.094 | 2.631 | 3.823 | 0.000 | 3.823 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The increase of $1.192M from FY17 to FY18 is for Product Development support of Digital Receiver and Exciter (DREX) critical design and Testing Support of Identification Friend or Foe (IFF) Antenna and Spectrum Testing and Analysis. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Continued Developmental Engineering Support for Mode5 Software Enhancement. | | | | | |
| ***FY 2017 Plans:***<br>-Continued Developmental Engineering Support for Mode 5 Level 1 (M5L1) Software Enhancement. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate developmental engineering support for Digital Receiver and Exciter (DREX).<br>***FY 2018 Base Plans:***<br>-Continue Developmental Engineering Support for Mode 5 Level 1 (M5L1) Software Enhancement.<br>-Continue developmental engineering support for DREX and initiate developmental engineering support for Array Erection.<br>-Initiate Identification Friend or Foe (IFF) testing support.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** AN/TPS-59: Test and Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>-Initiate Blackdart and Boldquest Testing Support, Mode 5 Level 1 (M5L1) Testing, and System of System Modernization Testing.<br>***FY 2018 Base Plans:***<br>-Continue Blackdart and Boldquest Testing Support, Mode 5 Level 1 (M5L1) Testing, and System of System Modernization Testing.<br>-Continue Moving Target Generator testing which will drastically reduce future test costs for Tactical Ballistic Missile (TBM) testing and System of System Capability testing.<br>-Initiate Identify Friend or Foe (IFF) Testing.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.373<br>- | 0.340<br>- | 0.000<br>- | 0.340<br>- |
| ***Title:*** FTAS: Product Development<br>***Articles:***<br>***Description:*** The overall FTAS effort has a total increase of $0.062 from FY17 to FY18 which is due to economic adjustments. However, Product Development increases by $798K as described below.<br>***FY 2016 Accomplishments:*** | 0.145<br>- | 0.448<br>- | 1.246<br>- | 0.000<br>- | 1.246<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiated development of Lightweight Counter Mortar Radar (LCMR) Mobile and Target Processing System (TPS).<br>***FY 2017 Plans:***<br>-Complete development of Lightweight Counter Mortar Radar (LCMR) Mobile and Target Processing System (TPS).<br>***FY 2018 Base Plans:***<br>-Initiate development of Lightweight Counter Mortar Radar (LCMR) tech refresh system.<br>-Initiate development of the Target Processing System (TPS) Kits for use within the Mobile Tactical Shelter (MTS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** FTAS: Support | 0.052 | 0.397 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed Developmental Safety Support.<br>***FY 2017 Plans:***<br>-Continue Tobyhanna Army Depot (TYAD)- ECP development on the AN/TSQ-267 and ECP development on the AN/TPQ-49.<br>***FY 2018 Base Plans:***<br>-Complete ECP development for AN/TSQ-267 and AN/TPQ-49.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** FTAS: Test and Evalution | 0.158 | 0.730 | 0.391 | 0.000 | 0.391 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Initiated the interoperability testing for the Family of Target Acquisition Systems (FTAS) integration within the Marine Air-Ground Task Force (MAGTF).<br>***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue the interoperability testing for the Family of Target Acquisition Systems (FTAS) integration within the Marine Air-Ground Task Force (MAGTF).<br>***FY 2018 Base Plans:***<br>-Continue interoperability testing for the Family of Target Acquisition Systems (FTAS) integration within the Marine Air-Ground Task Force (MAGTF).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SHORAD: Product Development<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Initiated Tactical Air Operations Module (TAOM) Interface Group (TIG) Development.<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | 0.060<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| ***Title:*** SHORAD: Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Completed developmental safety support through NSWC Indian Head.<br>***FY 2017 Plans:***<br>-Continue Diminishing Manufacturing Sources and Material Shortages (DMSMS) Engineering Change Proposal (ECP) Efforts at Other Government Agencies (OGAs).<br>***FY 2018 Base Plans:***<br>-Continue ECP Development Support at OGAs.<br>***FY 2018 OCO Plans:*** | 0.017<br>- | 0.194<br>- | 0.198<br>- | 0.000<br>- | 0.198<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** VWC: Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Continued to simulate war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area.<br>***FY 2017 Plans:***<br>-Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area.<br>***FY 2018 Base Plans:***<br>-Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area.<br>***FY 2018 OCO Plans:***<br>N/A | 1.652<br>- | 1.421<br>- | 1.389<br>- | 0.000<br>- | 1.389<br>- |
| ***Title:*** VWC: Test & Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>-Initiated System Of System (SOS) Modernization for increased capabilities through modeling and simulation for the Marine Air Command and Control System (MACCS).<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>-N/A<br>***FY 2018 OCO Plans:***<br>N/A | 0.708<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| **Accomplishments/Planned Programs Subtotals** | 3.972 | 13.423 | 14.015 | 0.000 | 14.015 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/465003: *AN/TPS-59* | 19.155 | 14.076 | 8.956 | - | 8.956 | 13.381 | 15.970 | 16.125 | 16.453 | Continuing | Continuing |
| • PMC/465005: *FTAS* | 2.844 | 2.984 | 2.735 | - | 2.735 | 2.871 | 2.953 | 3.010 | 3.070 | Continuing | Continuing |
| • PMC/465007: *SHORAD (AN/TPS-63)* | 0.465 | 0.712 | 0.720 | - | 0.720 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/463000: *AN/TPS-59 MCHS* | 0.000 | 0.142 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Long Range Radar (AN/TPS-59) - The AN/TPS-59 is a three dimensional ground-based sensor that can detect and track long range Air Breathing Targets (ABT) at ranges of 300 nautical miles and Tactical Ballistic Missiles (TBM) at ranges of 400 nautical miles. The system is experiencing increasing Obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. The program will use a support contract with the original equipment manufacturer (OEM) as well as Other Government Agencies (OGAs) to develop engineering changes to resolve DMSMS and incorporate Mode 5 Identification Friend or Foe (IFF) per DOD mandate.

Family of Target Acquisition Systems (FTAS) - The Family of Target Acquisition Systems consists of 3 major components: AN/TPQ-46, AN/TPQ-49 and the AN/TSQ-267. Of these 3 systems, the AN/TPQ-46 is due to be replaced by the Ground/Air Task Oriented Radar (G/ATOR) beginning in 2019. Sustainment activities during 2016 and beyond will be limited to maintain the authority to operate (ATO) creditation. Sustainment activities on the AN/TPQ-49 are escalating due to the fact the US Army divested from the AN/TPQ-49, the USMC has assumed the responsibilities of the primary inventory control activity (PICA). Program Office will conduct an engineering change to the AN/TPQ-49 to provide the operating forces with a mobile, stand-alone configuration. Sustainment activities on the AN/TPQ-46 will begin to escalate due to the US Army divestiture from the AN/TPQ-36. The USMC will assume some sustainment responsibilities for the AN/TPQ-46 until replaced by G/ATOR. Additionally, the AN/TSQ-267 requires hardware updates in order to continue housing the suite of equipment that supports the Target Processing Center (TPC) activities.

Short/Medium Range Air Defense Radar (SHORAD or AN/TPS-63) - The AN/TPS-63 is experiencing increasing Obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. The program will use Other Government Agencies (OGAs) to develop engineering changes to resolve DMSMS issues.

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area. VWC support encompasses a set of integrated fire control (IFC) activities that also includes concept/CONOPS development, family of systems architecture development, and systems engineering/integration efforts. The Office of Naval Research (ONR) is the lead for all VWC contracting actions.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/TPS-59 | SS/CPFF | LMC : SYRACUSE, NY | 4.390 | 0.000 | | 2.406 | Jun 2017 | 0.000 | | - | | 0.000 | 0.000 | 6.796 | - |
| AN/TPS-59 | WR | NSWC : CRANE, IN | 3.425 | 0.086 | Dec 2015 | 0.954 | Jun 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| AN/TPS-59 - DREX EDM Development | SS/CPFF | LMC : SYRACUSE, NY | 0.000 | 0.000 | | 2.326 | Aug 2017 | 4.500 | Dec 2017 | - | | 4.500 | 0.000 | 6.826 | - |
| AN/TPS-59 | C/FFP | NSWC Crane : CRANE, IN | 0.000 | 0.000 | | 0.243 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.243 | - |
| AN/TPS-59 - DREX Test Enviornment | SS/CPFF | LMC : SYRACUSE, NY | 0.000 | 0.000 | | 1.300 | Aug 2017 | 2.128 | Dec 2017 | - | | 2.128 | 0.000 | 3.428 | - |
| FTAS | MIPR | TYAD : TOBYHANNA, PA | 0.000 | 0.145 | Jul 2016 | 0.448 | Mar 2017 | 1.246 | Mar 2018 | - | | 1.246 | 0.000 | 1.839 | - |
| AN/TPS-63 | TBD | TBD : TBD | 0.000 | 0.060 | Jul 2017 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.060 | - |
| Prior Year Cumulative Funding | Various | VARIOUS : VARIOUS | 76.377 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 76.377 | - |
| | | **Subtotal** | 84.192 | 0.291 | | 7.677 | | 7.874 | | - | | 7.874 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/TPS-59 | MIPR | MITRE : BEDFORD, MA | 7.784 | 0.202 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| AN/TPS-59 | Various | MCSC : QUANTICO, VA | 1.994 | 0.000 | | 1.651 | Feb 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| AN/TPS-59 | C/CPFF | LOCKHEED MARTIN : SYRACUSE, NY | 8.789 | 0.000 | | 0.980 | Jun 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| AN/TPS-59 | Various | MCSC COMP : QUANTICO, VA | 6.288 | 0.026 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| AN/TPS-59 - Engineering Support | C/FFP | MCSC : QUANTICO, VA | 0.000 | 0.000 | | 0.000 | | 3.223 | Nov 2017 | - | | 3.223 | 0.000 | 3.223 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>3099 / *Radar System* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/TPS-59 - Array Erection Development Support | WR | NSWC : Crane, IN | 0.000 | 0.000 | | 0.000 | | 0.600 | Feb 2018 | - | | 0.600 | 0.000 | 0.600 | - |
| AN/TPS-59 | WR | NSWC : PORT HUENEME, VA | 0.000 | 0.866 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.866 | - |
| FTAS | C/FFP | NSWC : Indian Head, MD | 7.579 | 0.052 | Feb 2017 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| FTAS | MIPR | TYAD : TOBYHANNA, PA | 0.693 | 0.000 | | 0.397 | Mar 2017 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| FTAS | Various | MCSC : QUANTICO, VA | 2.188 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| VWC | C/CPFF | ONR : ST. LOUIS, MO | 15.679 | 1.652 | May 2016 | 1.421 | Feb 2017 | 0.945 | Feb 2018 | - | | 0.945 | Continuing | Continuing | Continuing |
| AN/TPS-63 | WR | NSWC : CRANE, IN | 0.130 | 0.000 | | 0.194 | May 2017 | 0.198 | Mar 2018 | - | | 0.198 | 0.000 | 0.522 | - |
| AN/TPS-63 | C/FFP | NSWC : Indian Head, MD | 0.000 | 0.017 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.017 | - |
| Prior Year Cumulative Funding | Various | VARIOUS : VARIOUS | 20.171 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 20.171 | - |
| | | **Subtotal** | 71.295 | 2.815 | | 4.643 | | 4.966 | | - | | 4.966 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN/TPS-59 | C/FFP | NSWC : CRANE, IN | 0.000 | 0.000 | | 0.373 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.373 | - |
| AN/TPS-59 -Testing Travel | Various | VARIOUS : VARIOUS | 0.000 | 0.000 | | 0.000 | | 0.090 | Dec 2017 | - | | 0.090 | 0.000 | 0.090 | - |
| AN/TPS-59 - IFF Antenna Testing | WR | NSWC : CRANE, IN | 0.000 | 0.000 | | 0.000 | | 0.250 | Nov 2017 | - | | 0.250 | 0.000 | 0.250 | - |
| FTAS | C/FFP | MCTSSA : CAMP PENDLETON, CA | 0.000 | 0.110 | Sep 2016 | 0.730 | Mar 2017 | 0.391 | Mar 2018 | - | | 0.391 | 0.000 | 1.231 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FTAS | MIPR | APG : Aberdeen, MD | 0.000 | 0.048 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.048 | - |
| VWC | C/CPFF | ONR : St Louis, MO | 0.000 | 0.708 | Aug 2016 | 0.000 | | 0.444 | May 2018 | - | | 0.444 | 0.000 | 1.152 | - |
| Prior Year Cumulative Funding | Various | VARIOUS : VARIOUS | 3.495 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.495 | - |
| | | **Subtotal** | 3.495 | 0.866 | | 1.103 | | 1.175 | | - | | 1.175 | 0.000 | 6.639 | - |

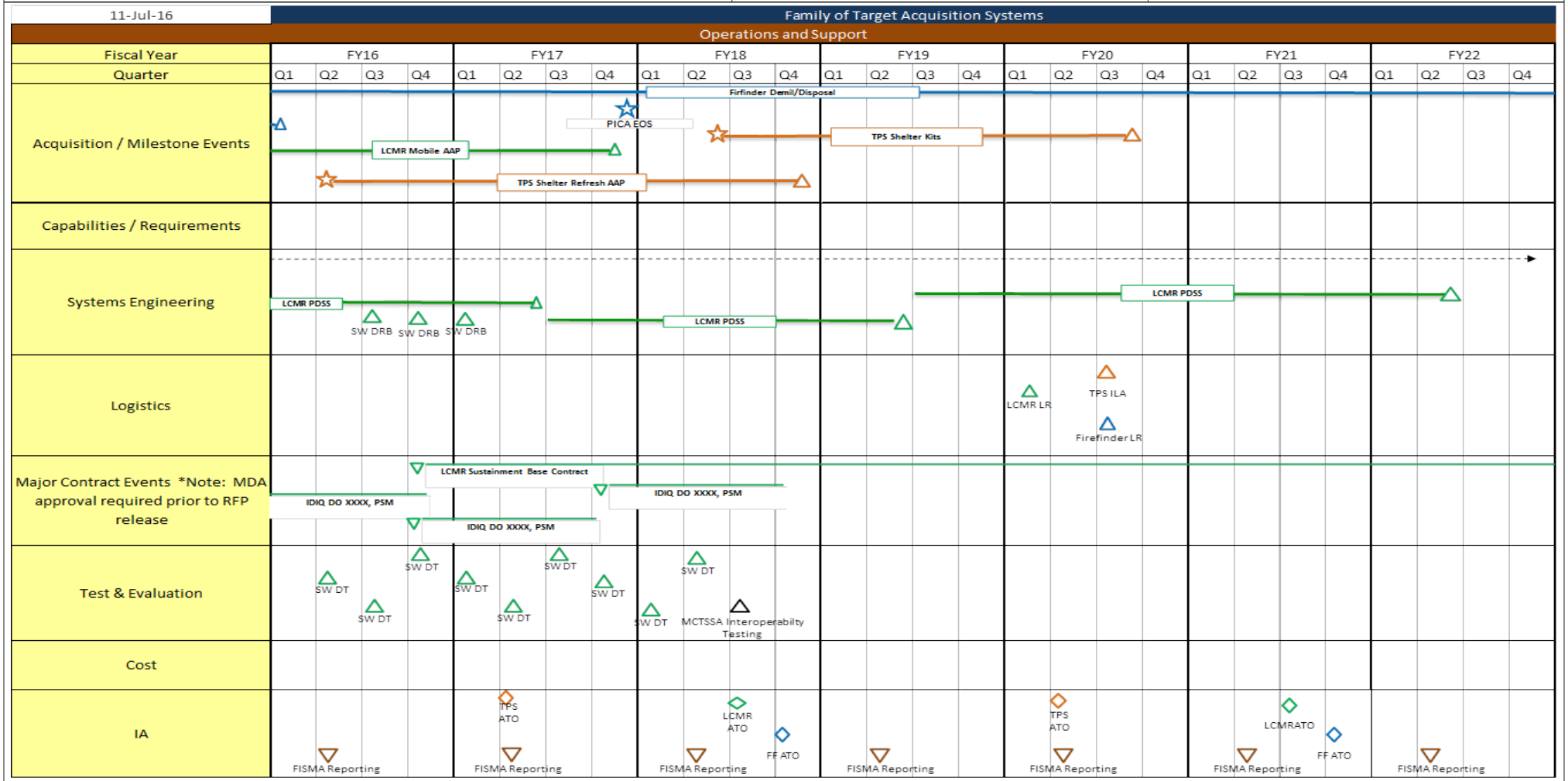
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Cumulative Funding | C/CPFF | MCSC: GENERAL DYNAMICS : QUANTICO, VA | 25.981 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 25.981 | - |
| | | **Subtotal** | 25.981 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 25.981 | - |

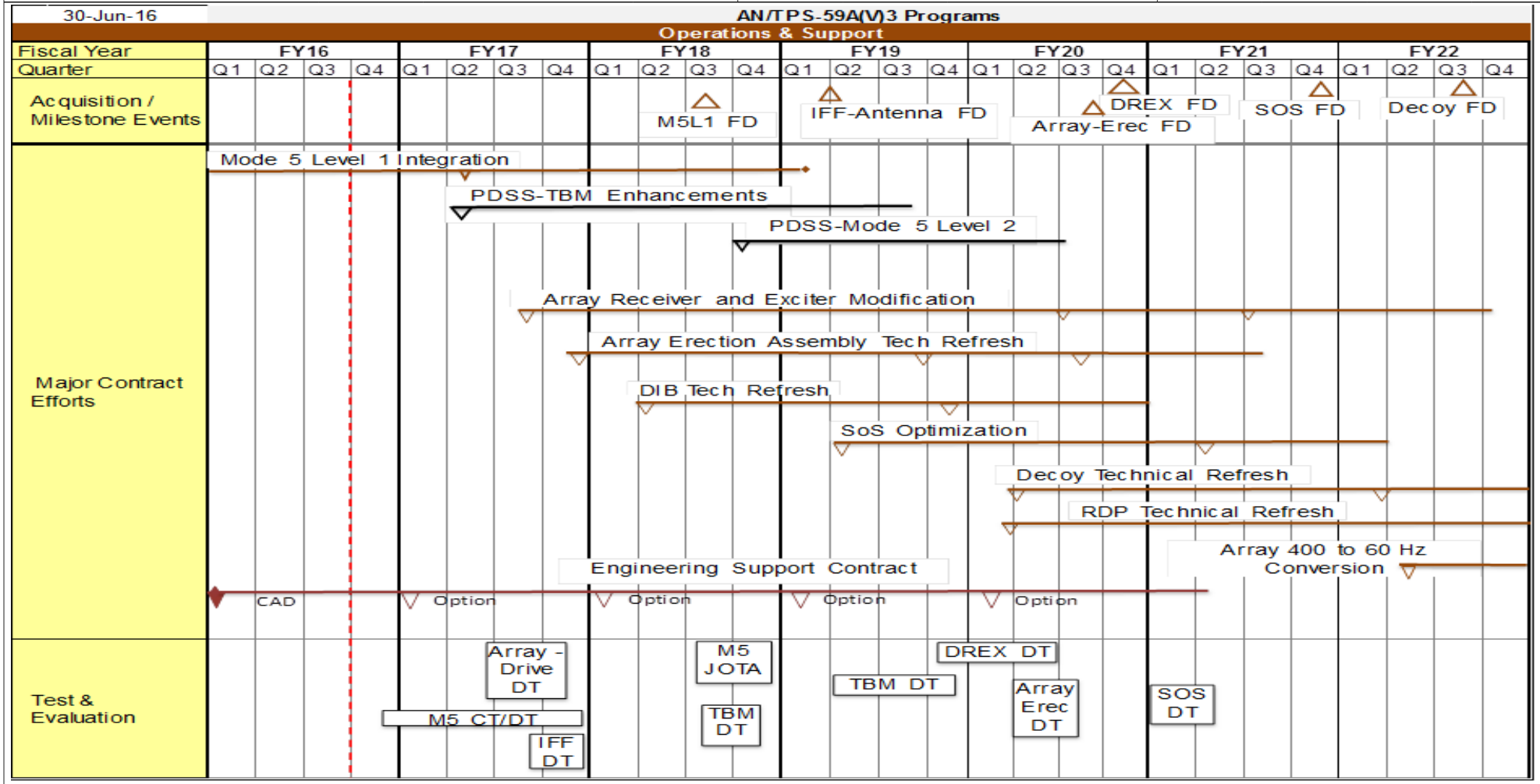
| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 184.963 | 3.972 | | 13.423 | | 14.015 | | - | | 14.015 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>3099 / *Radar System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 3099*** | | | | |
| AN/TPS-59 - Mode 5 Joint Operational Test Event | 3 | 2018 | 4 | 2018 |
| AN/TPS-59 - Identify Friend Foe Antenna Fielding Decision | 1 | 2019 | 1 | 2019 |
| AN/TPS-59 - Digital Exciter and Receiver Fielding Decision | 4 | 2020 | 4 | 2020 |
| FTAS - LCMR Mobile FOC | 4 | 2017 | 4 | 2017 |
| FTAS - TPS Shelter Refresh FOC | 4 | 2018 | 4 | 2018 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206313M / *Marine Corps Comms Systems* | Project (Number/Name)<br>9999 / *Congressional Adds* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9999: *Congressional Adds* | 0.000 | 12.552 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.552 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

Congressional Add, not required for BES/PB-18

**A. Mission Description and Budget Item Justification**

Long Range Radar (AN/TPS-59) - The AN/TPS-59A(V)3 is a transportable, three dimensional, tactical radar system that provides the Marine Air Ground Task Force (MAGTF) with long-range surveillance. It is the MAGTF's only ground based long range sensor that provides the capability to detect and report Air Breathing Targets (ABT) and track Theater Ballistic Missiles (TBM). The AN/TPS-59A(V)3 Radar System is connected to the AN/TSQ-269 Mobile -TAOM (M-TAOM) or the Common Aviation Command and Control Systems (CAC2S). It provides the air defense controllers data and may be used autonomously to conduct Ground control Intercept, tactical en-route Air Traffic Control (ATC), or TBM alert operations via the joint Integrated Air Missile Defense (IAMD) encrypted Link-16. The USMC extended the AN/TPS-59 service life through 2035; therefore, in order to maintain its operational relevance on the battlefield, a number of modernization efforts are being initiated. The Digital Receiver and Exciter (DREX) upgrade will convert the analog receivers and exciters to digital to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, enable spectral agility, reduce noise, reduce false alarms, and enhance electronic counter-countermeasures (ECCM) capability. This effort will include an essential simulation and test environment capability. The AN/TPS-59 radar has been continuously deployed in support of Operation Freedom Sentinel (OFS) and other contingencies.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2016 | FY 2017 |
|---|---|---|
| ***Congressional Add:*** Radar Enhancements | 12.552 | 0.000 |
| ***FY 2016 Accomplishments:*** - Completed "Identify Friend or Foe" (IFF) Engineering Change Proposal (ECP) development.<br>- Initiated development of Theater Ballistic Missile (TBM), Tactical Air Operations Module (TAOM) Interface Group (TIG), Modular Azimuth Positioning System (MAPs) Reader, and Uninterruptible Power Supply (UPS) ECPs, and Mode 5 Testing. | | |
| ***FY 2017 Plans:*** N/A | | |
| **Congressional Adds Subtotals** | 12.552 | 0.000 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206313M / *Marine Corps Comms Systems* | **Project (Number/Name)**<br>9999 / *Congressional Adds* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/465000: *AN/TPS-59 Mods* | 19.155 | 14.076 | 8.956 | - | 8.956 | 13.381 | 15.970 | 16.125 | 16.453 | Continuing | Continuing |
| • PMC/463000: *AN/TPS-59 MCHS* | 0.000 | 0.142 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • RDTE/0206313M/ C3099: *AN/TPS-59 Mods* | 1.180 | 10.233 | 10.791 | - | 10.791 | 19.336 | 14.066 | 13.586 | 14.847 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Long Range Radar (AN/TPS-59) - The AN/TPS-59 is a three dimensional ground-based sensor that can detect and track long range Air Breathing Targets (ABT) at ranges of 300 nautical miles and Tactical Ballistic Missiles (TBM) at ranges of 400 nautical miles. The system is experiencing increasing Obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues. The program will use a support contract with the original equipment manufacturer (OEM) as well as Other Government Agencies (OGAs) to test Mode 5 Identification Friend or Foe (IFF) and develop Theater Ballistic Missile (TBM), Modular Azimuth Positioning System (MAPS) Reader, and Tactical Air Operations Module (TAOM) Interface Group (TIG) Engineering Change Proposals (ECPs).

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 31.568 | 13.959 | 11.850 | 7.343 | - | 7.343 | 4.936 | 4.524 | 4.382 | 4.468 | Continuing | Continuing |
| 3373: *Common Aviation Command and Control System (CAC2S)* | 31.568 | 13.959 | 11.850 | 7.343 | - | 7.343 | 4.936 | 4.524 | 4.382 | 4.468 | Continuing | Continuing |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** MN36 | | | | | | | | | | | | |

**Note**

Funding for FY 2014 and prior is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Ops Cmd & Control (C2) Sys.

**A. Mission Description and Budget Item Justification**

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S with these organic MACCS programs support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC).

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | **R-1 Program Element (Number/Name)**<br>PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 13.431 | 11.850 | 7.307 | - | 7.307 |
| Current President's Budget | 13.959 | 11.850 | 7.343 | - | 7.343 |
| Total Adjustments | 0.528 | 0.000 | 0.036 | - | 0.036 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.823 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.294 | 0.000 | | | |
| • Rate/Misc Adjustments | -0.001 | 0.000 | 0.036 | - | 0.036 |

**Change Summary Explanation**

Funding decreases, in the amount of $4.507M, from FY 2017 to FY 2018 largely due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | Project (Number/Name)<br>3373 / *Common Aviation Command and Control System (CAC2S)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3373: *Common Aviation Command and Control System (CAC2S)* | 31.568 | 13.959 | 11.850 | 7.343 | - | 7.343 | 4.936 | 4.524 | 4.382 | 4.468 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** MN36

**Note**

Prior year funding is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

**A. Mission Description and Budget Item Justification**

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63,
AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S with these organic MACCS programs support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC). Funding decreases, in the amount of $4.507M, from FY 2017 to FY 2018 largely due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 1.175 | 5.747 | 1.063 | 0.000 | 1.063 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The total program decrease of $4.507M from FY 2017 to FY 2018 is largely due to the completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECP) development resulting from IOT&E. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Conducted validation and verification of the four CAC2S Phase 2 Limited Deployment Units (LDUs).<br>***FY 2017 Plans:***<br>- Initiate development of ECPs resulting from the developmental testing (DT) of LDUs.<br>- Initiate CAC2S Phase 1 Communication Subsystem hardware modification development effort.<br>- Complete hardware and software engineering support to provide CAC2S Phase 2 ECP development resulting from IOT&E.<br>***FY 2018 Base Plans:***<br>- Complete the initial integration of CAC2S with G/ATOR and associated CTN implementation.<br>- Perform root cause analysis of G/ATOR and related CTN findings resulting from G/ATOR DT-C1 and OA.<br>- Implement the required corrections resulting from G/ATOR DT-C1 and OA test events.<br>- Continue CAC2S Phase 1 Communication Subsystem hardware modification development effort.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support and Management Services | 3.831 | 2.828 | 2.094 | 0.000 | 2.094 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued support of Phase 2 cyber security certification test scans.<br>- Completed test data analysis for CAC2S Phase 2 DT.<br>- Conducted Operational Test Readiness Review (OTRR).<br>- Provided MITRE support during CAC2S Phase 2 IOT&E.<br>***FY 2017 Plans:***<br>- Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO).<br>- Provide design and development support of the CAC2S Phase 1 Communication Subsystem (CS) to mitigate system obsolescence and to ensure accreditation is maintained.<br>- Continue MITRE support during G/ATOR DT-C1, and Operational Assessment (OA) test events.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO).<br>- Perform root cause analysis of G/ATOR and related CTN findings, implement the required corrections to support the G/ATOR DT-1E and IOT&E events.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation | 8.953 | 3.275 | 4.186 | 0.000 | 4.186 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Conducted CAC2S Phase 2 interoperability Independent Verification and Validation (IV&V) with the CEC and CTN.<br>- Conducted CAC2S Phase 2 Developmental Test C2 (DT-C2) with LDUs in preparation for Initial Operational Test and Evaluation (IOT&E).<br>- Completed CAC2S Phase 2 System Level Test.<br>- Conducted CAC2S Phase 2 Joint Interoperability Test.<br>- Conducted CAC2S Phase 2 IOT&E. | | | | | |
| ***FY 2017 Plans:***<br>- Conduct Interoperability testing with G/ATOR.<br>- Initiate interface test support during G/ATOR DT-C1 and Operational Assessment (OA) test events.<br>- Prepare for G/ATOR DT-1E, IOT&E and CAC2S Phase 2 FOT&E test events occurring in FY 2018. | | | | | |
| ***FY 2018 Base Plans:***<br>Increase from FY 2017 to FY 2018 is due to providing interface support during G/ATOR DT-1E and IOT&E as well as CAC2S Phase 2 FOT&E test events.<br>- Complete interface test support during G/ATOR DT-C1 and OA test events.<br>- Initiate interface test support during G/ATOR DT-1E and IOT&E.<br>- Initiate and approve the Air Command and Control Interface Design Document (IDD). Implement the software changes resulting from the updated and approved IDD and support the certification testing of the associated IDD CTN software adaptive layer. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Implement the Mode 5, Mode S and CTN Web Identification software changes required to support the CAC2S FOT&E and close out the caveats identified in the CAC2S Joint Interoperability Certification memorandum.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.959 | 11.850 | 7.343 | 0.000 | 7.343 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4644: *Common Aviation Command And Control System (CAC2S)* | 16.623 | 53.012 | 44.928 | - | 44.928 | 32.875 | 41.504 | 34.228 | 17.553 | 5.176 | 259.729 |

**Remarks**

RDT&E prior to FY15 is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

PMC funding for FY15 and beyond is listed in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY15 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

**D. Acquisition Strategy**

CAC2S will employ an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S will be accomplished through a two phased approach. Phase 1 addresses the requirements to establish the baseline CAC2S capabilities for the MACCS and improve Air Command and Control (AC2) performance and effectiveness. Phase 2 will address the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | Project (Number/Name)<br>3373 / *Common Aviation Command and Control System (CAC2S)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Development | WR | NSWC CD : Crane, IN | 1.031 | 0.753 | Nov 2015 | 0.258 | Nov 2016 | 0.264 | Nov 2017 | - | | 0.264 | 0.896 | 3.202 | - |
| Engineering Manufacturing and Development | C/FPIF | General Dynamics : Pheonix, AZ | 3.800 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 16.544 | 20.344 | 59.922 |
| Software Development | WR | NSWC DD : Dahlgren, VA | 1.951 | 0.422 | Nov 2015 | 0.813 | Nov 2016 | 0.799 | Nov 2017 | - | | 0.799 | 0.000 | 3.985 | - |
| Hardware and Software Engineering | C/CPIF | NSWC CD : Crane, IN | 0.000 | 0.000 | | 4.676 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 4.676 | - |
| | | **Subtotal** | 6.782 | 1.175 | | 5.747 | | 1.063 | | - | | 1.063 | 17.440 | 32.207 | - |

**Remarks**

Decrease in FY 2018 is due to completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reliability Assessment | MIPR | AMSSA : Aberdeen, MD | 0.501 | 0.300 | Nov 2015 | 0.185 | Nov 2016 | 0.000 | | - | | 0.000 | 0.238 | 1.224 | - |
| Architecture Support | WR | SpaWar : Charleston, SC | 0.250 | 0.200 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.350 | 0.800 | - |
| Interoperability Certification | MIPR | JITC : Fort Huachuca, AZ | 0.500 | 0.300 | Nov 2015 | 0.077 | Nov 2016 | 0.000 | | - | | 0.000 | 0.265 | 1.142 | - |
| Interoperability Certification | Sub Allot | MCTSSA : Camp Pendleton, CA | 0.170 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.170 | - |
| Data Analysis | WR | NSWC Corona : Corona, CA | 0.376 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.376 | - |
| Logistics Support | Sub Allot | LogCom : Albany, GA | 0.502 | 0.219 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.302 | 1.023 | - |
| Safety Engineering | C/FP | MCSC Safety : TBD | 0.250 | 0.175 | Nov 2015 | 0.411 | Nov 2016 | 0.000 | | - | | 0.000 | 0.095 | 0.931 | - |
| Travel | Various | Travel : TBD | 0.000 | 0.143 | Oct 2015 | 0.072 | Oct 2016 | 0.050 | Oct 2017 | - | | 0.050 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | Project (Number/Name)<br>3373 / *Common Aviation Command and Control System (CAC2S)* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Engineering | WR | NSWC DD : Dahlgren, VA | 0.000 | 0.528 | Feb 2016 | 1.117 | Nov 2016 | 1.151 | Nov 2017 | - | | 1.151 | 0.000 | 2.796 | - |
| Hardware Engineering | WR | NSWC CD : Crane, IN | 0.000 | 0.000 | | 0.399 | Nov 2016 | 0.372 | Nov 2017 | - | | 0.372 | 0.000 | 0.771 | - |
| | | **Subtotal** | 2.549 | 1.865 | | 2.261 | | 1.573 | | - | | 1.573 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Testing and Evaluation | WR | NSWC - Port Huenueme : Port Huenueme, CA | 1.001 | 0.750 | Nov 2015 | 0.597 | Nov 2016 | 0.623 | Nov 2017 | - | | 0.623 | 0.955 | 3.926 | - |
| Testing and Evaluation | Sub Allot | MCOTEA : Quantico, VA | 1.338 | 1.200 | Jan 2016 | 0.500 | Jan 2017 | 0.000 | | - | | 0.000 | 3.465 | 6.503 | - |
| Testing and Evaluation | WR | MACCS - 2 : Cherry Point, NC | 0.500 | 0.261 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.125 | 0.886 | - |
| Testing and Evaluation | Sub Allot | MCTSSA : Camp Pendleton, CA | 6.200 | 0.876 | Nov 2015 | 0.288 | Nov 2016 | 0.250 | Nov 2017 | - | | 0.250 | 0.952 | 8.566 | - |
| Testing and Evaluation | MIPR | NAWC AB : Patuxent River, MD | 6.000 | 1.863 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 1.258 | 9.121 | - |
| Testing and Evaluation | WR | NSWC CD : Crane, IN | 4.426 | 2.652 | Nov 2015 | 0.555 | Nov 2016 | 0.907 | Nov 2017 | - | | 0.907 | 7.445 | 15.985 | - |
| Testing and Evaluation | WR | NSWC DD : Dahlgren, VA | 0.000 | 1.351 | Nov 2015 | 1.335 | Nov 2016 | 2.406 | Nov 2017 | - | | 2.406 | 0.000 | 5.092 | - |
| | | **Subtotal** | 19.465 | 8.953 | | 3.275 | | 4.186 | | - | | 4.186 | 14.200 | 50.079 | - |

**Remarks**

Increase in FY 2018 is due to initiation of CAC2S Phase 2 FOT&E and providing integrated test support during G/ATOR DT-1E and IOT&E.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* | |

**Management Services ($ in Millions)**

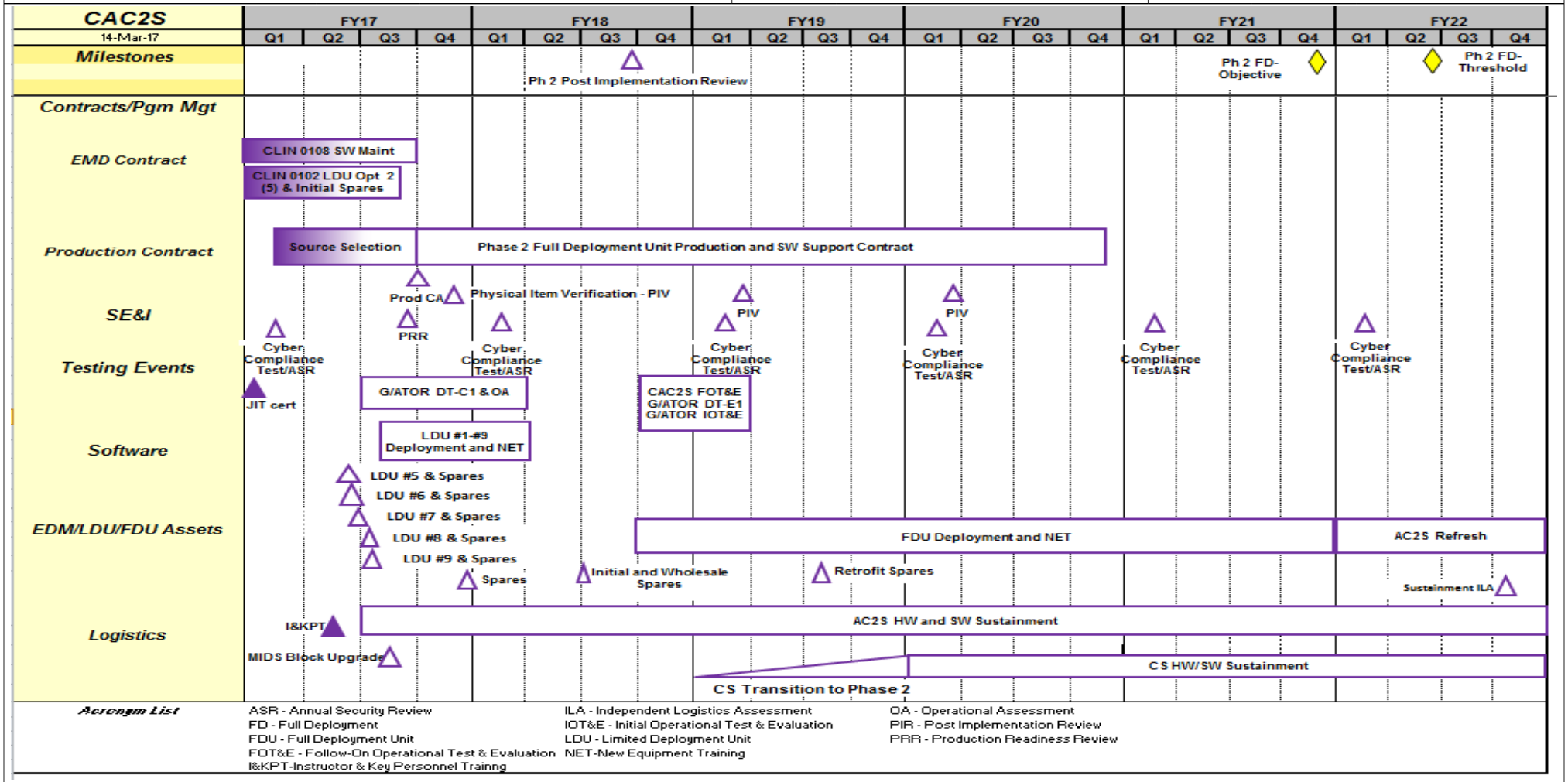
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering and Program Management Support | C/FFP | Get It Done (GID) Solutions LLC : Fredericksburg, VA | 1.752 | 0.980 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.732 | 19,096.227 |
| Sensor Management | C/FFP | MITRE : Bedford, MA | 1.020 | 0.986 | Oct 2015 | 0.567 | Oct 2016 | 0.521 | Oct 2017 | - | | 0.521 | 2.958 | 6.052 | - |
| | | **Subtotal** | 2.772 | 1.966 | | 0.567 | | 0.521 | | - | | 0.521 | 2.958 | 8.784 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 31.568 | 13.959 | | 11.850 | | 7.343 | | - | | 7.343 | - | - | - |

**Remarks**

Funding decreases, in the amount of $4.507M, from FY 2017 to FY 2018 due to the completion of hardware and software engineering in support of Phase 2 Engineering Change Proposals (ECPs) resulting from IOT&E.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)* | **Project (Number/Name)**<br>3373 / *Common Aviation Command and Control System (CAC2S)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 3373*** | | | | |
| Full Deployment Unit (FDU) Production Contract (PMC BLI 464400) | 3 | 2017 | 4 | 2020 |
| Communication Subsystem (CS) Hardware Modification Development (Phase 1) | 2 | 2017 | 3 | 2018 |
| Limited Deployment Units (LDU) 1-9 deliveries, deployment and NET (PMC BL 464400) | 3 | 2017 | 2 | 2018 |
| Interoperability Testing for G/ATOR Developmental Test - C1 & Operational Assessment | 3 | 2017 | 2 | 2018 |
| Cyber Compliance Test / Annual Service Review FY18 | 1 | 2018 | 1 | 2018 |
| Full Deployment Unit (FDU) deployment and NET (PMC BLI 464400) | 3 | 2018 | 4 | 2021 |
| CAC2S Follow-On Operational Test & Evaluation | 4 | 2018 | 2 | 2019 |
| G/ATOR Initial Operational Test & Evaluation | 4 | 2018 | 2 | 2019 |
| G/ATOR Developmental Test - 1E | 3 | 2018 | 2 | 2019 |
| Cyber Compliance Test / Annual Service Review FY19 | 1 | 2019 | 1 | 2019 |
| Cyber Compliance Test / Annual Service Review FY20 | 1 | 2020 | 1 | 2020 |
| Cyber Compliance Test / Annual Service Review FY21 | 1 | 2021 | 1 | 2021 |
| Cyber Compliance Test / Annual Service Review FY22 | 1 | 2022 | 1 | 2022 |
| CAC2S Full Deployment Threshold | 2 | 2022 | 2 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0206623M *I MC Ground Cmbt Spt Arms Sys* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 537.373 | 55.058 | 51.835 | 66.009 | - | 66.009 | 72.811 | 78.119 | 97.093 | 132.960 | Continuing | Continuing |
| 1555: *Lt Armored Vehicle Prog* | 107.475 | 10.732 | 13.879 | 13.650 | - | 13.650 | 7.445 | 4.931 | 4.723 | 3.242 | Continuing | Continuing |
| 1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)* | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 15.622 | 21.000 | 37.960 | 79.279 | Continuing | Continuing |
| 1901: *MC Grnd Wpnry Prod Improvement* | 36.645 | 4.155 | 3.689 | 3.512 | - | 3.512 | 5.921 | 5.514 | 5.300 | 5.404 | Continuing | Continuing |
| 2086: *Soldier/Marine Enhancement* | 28.447 | 2.140 | 3.140 | 3.340 | - | 3.340 | 4.707 | 4.251 | 3.992 | 4.069 | Continuing | Continuing |
| 2237: *Amphibious Vehicle Test* | 3.164 | 6.324 | 0.991 | 2.861 | - | 2.861 | 2.833 | 2.897 | 2.963 | 3.025 | Continuing | Continuing |
| 2315: *Training Devices/ Simulators* | 118.038 | 11.848 | 17.183 | 23.927 | - | 23.927 | 16.882 | 19.481 | 22.356 | 19.791 | Continuing | Continuing |
| 2503: *Initial Issue* | 44.483 | 1.775 | 3.462 | 4.656 | - | 4.656 | 5.336 | 4.842 | 4.492 | 4.579 | Continuing | Continuing |
| 2513: *Body Armor* | 45.501 | 2.863 | 2.746 | 4.380 | - | 4.380 | 5.015 | 4.900 | 4.823 | 4.919 | Continuing | Continuing |
| 2928: *Exp Indirect Fire Gen Supt Wpn Sys* | 11.464 | 1.316 | 1.054 | 2.990 | - | 2.990 | 2.632 | 2.161 | 2.207 | 2.249 | Continuing | Continuing |
| 3098: *Fire Support System* | 138.392 | 13.391 | 5.242 | 6.145 | - | 6.145 | 5.871 | 7.606 | 7.727 | 5.842 | Continuing | Continuing |
| 4002: *Family of Raid Reconnaissance* | 3.764 | 0.514 | 0.449 | 0.548 | - | 0.548 | 0.547 | 0.536 | 0.550 | 0.561 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability and operational effectiveness. In addition, the PE provides for the development of AAV7A1 reliability, maintainability, operational and safety modifications, improvements in command and control, and product improvements to the family of LAVs. The Amphibious Vehicle Test Branch (AVTB) provides facilities and personnel which perform a broad range of testing, repair and technical services to amphibious vehicles. This program is funded under Operational Systems Development Program Element (PE) because it encompasses engineering and manufacturing and manufacturing development for upgrades of existing systems.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | **R-1 Program Element (Number/Name)**<br>PE 0206623M *I MC Ground Cmbt Spt Arms Sys* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 48.590 | 47.877 | 47.582 | - | 47.582 |
| Current President's Budget | 55.058 | 51.835 | 66.009 | - | 66.009 |
| Total Adjustments | 6.468 | 3.958 | 18.427 | - | 18.427 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 7.690 | 0.000 | | | |
| • SBIR/STTR Transfer | -1.223 | 0.000 | | | |
| • Program Adjustments | 0.000 | 3.958 | 18.420 | - | 18.420 |
| • Rate/Misc Adjustments | 0.001 | 0.000 | 0.007 | - | 0.007 |

**Change Summary Explanation**

The increase from FY17 to FY18 of $14.174M can be attributed to the Training devices/simulators program requirement to move the SAVT into the capability arena to inter-operate with other training devices, and AVTB program for increased test support for the Amphibious Combat Vehicle and Assault Amphibious Vehicle.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>1555 / *Lt Armored Vehicle Prog* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1555: *Lt Armored Vehicle Prog* | 107.475 | 10.732 | 13.879 | 13.650 | - | 13.650 | 7.445 | 4.931 | 4.723 | 3.242 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Family of Light Armored Vehicles (FOLAV) consists of six fielded LAV configurations and one communications/intelligence-configured asset on an LAV chassis. The FOLAV provides a logistically self-contained, highly mobile, and lethal combined arms combat system to the Marine Air Ground Task Force (MAGTF). The LAV Product Improvement Program funds modification and sustainment activities and the development and testing of modifications. These programs will ensure that the FOLAV is capable of conducting its assigned missions by enhancing lethality and survivability; reliability, availability, maintainability and durability; as well as reducing operations and support costs.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** LAV Obsolescence (OB) | 10.732 | 13.879 | 12.576 | 0.000 | 12.576 |
| ***Articles:*** | - | 8 | - | - | - |
| ***Description:*** The decrease of $.229M from FY17 to FY18 can be attributed to the reduction in the Obsolescence effort and the start of the C4ISR Cryptographic modernization testing and integration effort, Joint Battle Command-Platform (JBC-P) integration, the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion/integration. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Continued Engineering Change Proposal (ECP), Integrated Logistic Support (ILS) data development, Technical Publications Development, Critical Design Review for the Obsolescence Kits consisting of Power pack, Driveline, Steering, Driver's Instrument Panel (DIP), LAV-25 Slip Ring, and Program Management (PM) support.<br>-Initiated Modification Instruction development for the LAV. | | | | | |
| ***FY 2017 Plans:***<br>-Continue Engineering Change Proposal (ECP), Modification Instruction development, Integrated Logistics Support (ILS) Data Development, Technical Publications Development, and PM support.<br>-Initiate Test Planning for Developmental Test and effort to build 8 prototype vehicles. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue PM support.<br>-Complete modification instruction development, complete 8 vehicle prototype builds, technical manual development, and execute Developmental Testing. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1555 / *Lt Armored Vehicle Prog* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate preparation towards Milestone C and preparation for Obsolescence Production Kit contract. Production contract consists of the OB Kits and completion of Logistics Products (technical manuals, provisioning, etc), Training (New Equipment Training, Instructor & Key Personnel Training, etc), Field Service Representative Support, Systems Technical Support, Initial Spares, Special Tools and Test Equipment, Test Vehicle Refurbishment, and Packaging support.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** LAV Modifications and Sustainment<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Initiate efforts for the design, configuration, prototyping, and testing of communication assets related to the Family of Light Armored Vehicles (FOLAV) to include; the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion, Joint Battle Command-Platform (JBC-P) implementation to meet situational awareness (blue force tracker) requirement, C4ISR Crypto Modernization to comply with National Security Agency (NSA) cryptographic requirements, and Global Positioning Satellite (GPS) M-Code.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 1.074<br>- | 0.000<br>- | 1.074<br>- |
| **Accomplishments/Planned Programs Subtotals** | 10.732 | 13.879 | 13.650 | 0.000 | 13.650 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/2038: *LAV PIP* | 88.756 | 53.423 | 17.244 | - | 17.244 | 44.697 | 63.676 | 66.206 | 57.503 | Continuing | Continuing |
| • PMC/7000: *LAV Spares* | 1.275 | 0.628 | 1.006 | - | 1.006 | 5.830 | 5.990 | 6.157 | 6.271 | Continuing | Continuing |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1555 / *Lt Armored Vehicle Prog* |

**D. Acquisition Strategy**

The LAV Modification & Sustainment program funds important vehicle modifications, support equipment and tools, and other projects that increase LAV reliability and readiness while simultaneously reducing operations and support costs. The Marine Corps Program Management LAV Modification Team uses multi-disciplined integrated project teams consisting of engineering, logistical, contracting and financial personnel to manage Modification projects. Currently the LAV Modification and Sustainment program will capture the ACAT IV(M) Obsolescence program (OB). The OB program will address the Family of Light Armored Vehicles (FOLAV) automotive system obsolescence and reduced performance due to increased Gross Vehicle Weight (GVW). The OB program will improve fleet reliability and availability by addressing the three sub-systems (power pack, driveline and steering) that specifically account for 95% of total system downtime. Also, fields a modern driver's instrument panel and LAV-25 Slip Ring. This effort will require delivery of 8 kits (7 installed on vehicles, 1 stand-alone kit) during the Engineering & Manufacturing Development (EMD) phase to support Developmental Testing (DT), fielding, Integrated Logistics Support (ILS) products, Modification Instructions (MI) and Engineering Change Proposals (ECP).

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>1555 / *Lt Armored Vehicle Prog* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4ISR Crypto MOD Integration | MIPR | SPAWAR : Charleston, NC | 0.000 | 0.000 | | 0.000 | | 1.074 | Nov 2017 | - | | 1.074 | 0.000 | 1.074 | - |
| ILS DATA DEV (MOD) | C/CPFF | GDLS : London Ontario, Canada | 13.351 | 1.535 | Jul 2016 | 2.245 | Apr 2017 | 1.625 | Dec 2017 | - | | 1.625 | Continuing | Continuing | Continuing |
| PRODUCT DEV/ PROTOTYPES (MOD) | C/CPFF | GDLS : London Ontario, Canada | 28.822 | 6.865 | Jul 2016 | 8.907 | Apr 2017 | 5.975 | Dec 2017 | - | | 5.975 | Continuing | Continuing | Continuing |
| Proj 1555: Prior Years Cumulative Funding | Various | N/A : N/A | 37.397 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 37.397 | - |
| | | **Subtotal** | 79.570 | 8.400 | | 11.152 | | 8.674 | | - | | 8.674 | - | - | - |

**Remarks**

The decrease from FY17 to FY18 is reduced effort on the Obsolescence contract and an increase in support of the C4ISR Crypto modernization integration, Joint Battle Command-Platform (JBC-P) integration, the Enhanced Position Location Reporting System (EPLRS)/117G data radio conversion/integration.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Proj 1555: Prior Years Cumulative Funding | Various | N/A : N/A | 11.860 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.860 | - |
| Program Mgmt (MOD) | MIPR | TACOM : Warren, MI | 7.396 | 2.332 | Dec 2015 | 2.551 | Dec 2016 | 2.268 | Dec 2017 | - | | 2.268 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 19.256 | 2.332 | | 2.551 | | 2.268 | | - | | 2.268 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Proj 1555: Prior Years Cumulative Funding | Various | N/A : N/A | 6.105 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.105 | - |
| Devl/Oper T&E (MOD) | MIPR | RTC : AL | 1.464 | 0.000 | | 0.176 | Nov 2016 | 2.708 | Jan 2018 | - | | 2.708 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 7.569 | 0.000 | | 0.176 | | 2.708 | | - | | 2.708 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>1555 / *Lt Armored Vehicle Prog* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

The increase from FY17 to FY18 is in support of the Obsolescence program developmental testing.

**Management Services ($ in Millions)**

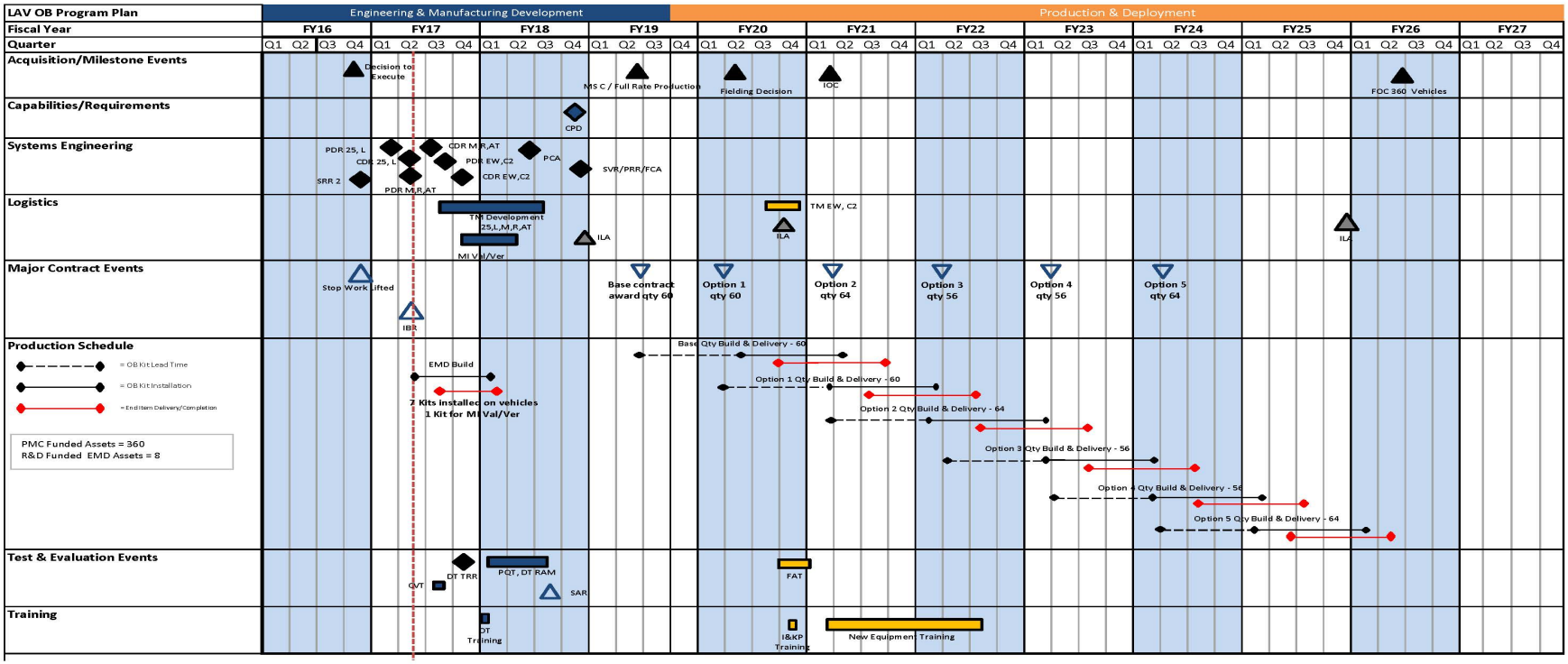
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Proj 1555: Prior Years Cumulative Funding | Various | N/A : N/A | 1.080 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.080 | - |
| | | **Subtotal** | 1.080 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.080 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 107.475 | 10.732 | | 13.879 | | 13.650 | | - | | 13.650 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1555 / *Lt Armored Vehicle Prog* |

OB_Summary_Program_Plan_EMD Based on GDLS Sched Rev L



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1555 / *Lt Armored Vehicle Prog* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***LAV Modification and Sustainment*** | | | | |
| Integration Contract | 1 | 2016 | 2 | 2019 |
| TM Development | 3 | 2017 | 3 | 2018 |
| Contractor Verification Test | 3 | 2017 | 3 | 2017 |
| EMD Vehicle Delivery | 3 | 2017 | 1 | 2018 |
| Developmental Testing | 1 | 2018 | 3 | 2018 |
| Mod Instruction Val/Ver | 4 | 2017 | 2 | 2018 |
| MS-C | 2 | 2019 | 2 | 2019 |
| Base Contract Award | 2 | 2019 | 2 | 2019 |
| Option 1 Award | 1 | 2020 | 1 | 2020 |
| Fielding Decision | 2 | 2020 | 2 | 2020 |
| IOC | 1 | 2021 | 1 | 2021 |
| Option 2 Award | 1 | 2021 | 1 | 2021 |
| Option 3 Award | 1 | 2022 | 1 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)* | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 15.622 | 21.000 | 37.960 | 79.279 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Armored Reconnaissance Vehicle (ARV) is a replacement for the legacy light armored vehicle in the Light Armored Reconnaissance (LAR) battalions within the Marine Divisions. ARV equipped LAR Battalions perform combined arms, all weather, sustained reconnaissance and security missions in support the Ground Combat Element. The ARV is the core capability that underpins the next generation armored reconnaissance capability concept. The ARV will be a modern combat vehicle system, capable of fighting for information, that balances competing capability demands to sense, shoot, move, communicate and remain transportable as part of the naval expeditionary force.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>1901 / *MC Grnd Wpnry Prod Improvement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1901: *MC Grnd Wpnry Prod Improvement* | 36.645 | 4.155 | 3.689 | 3.512 | - | 3.512 | 5.921 | 5.514 | 5.300 | 5.404 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project develops joint and Marine Corps unique improvements to infantry weapons technology, non-lethal systems technology, improvements for Night Vision Equipment, Rifle Combat Optics, Family of Individual Optics, and monitors national and international weapons developments.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Escalation of Force-Equipment (EoF-E) | 0.085 | 0.038 | 0.085 | 0.000 | 0.085 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Escalation of Force Equipment (EoF-E) is a mod funding line to support/sustain all fielded EoF equipment and capabilities. Additionally, EoF-E supports type-classification, testing and procurement of new advancements and technologies to provide an increased capability over existing or obsolescent equipment currently in or associated with the Escalation of Force Mission Modules (EoF-MMs).<br><br>***FY 2016 Accomplishments:***<br>-Continued assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities.<br>-Completed assessment of upgrades and replacements to the LA-9/P Lasers to sustain/support equipment and capabilities.<br><br>***FY 2017 Plans:***<br>-Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities.<br><br>***FY 2018 Base Plans:***<br>-Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Combat Optics | 0.796 | 1.748 | 1.722 | 0.000 | 1.722 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1901 / *MC Grnd Wpnry Prod Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |

***Description:*** Combat Optics is a program that provides for research and development, as well as ammunition to support testing and assessment of optical systems and implementation of modifications for these systems as well as life-cycle management efforts. The research and development of future capabilities include, but are not limited to, fused/multi-spectral (e.g., combined image intensifier, thermal imaging, and short wave infrared) optical and laser systems. Additionally, this line supports the procurement of over 600,000 magnified day optics, thermal imagers, image intensifier, lasers, and illuminators principle end items (PEI) due to combat losses, wash-outs, and increases in Approved Acquisition Objectives. Sustainment efforts include sustainment of optics capabilities and/or improvements to the performance, maintainability, supportability, service life, ergonomics, and safety enhancements.

***FY 2016 Accomplishments:***
-Continued technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continued coordination with United States Army on long wave and short wave infrared technologies.
-Initiated procurement of Sniper Range Finder test articles, for testing and eventual selection of system for procurement.
-Completed source selection for award of contract to initiate and complete design of a Dual-Channel Heavy Sight (DCHS) prototype to inform the development of a joint capability document for future production.

***FY 2017 Plans:***
-Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continue coordination with United States Army on long wave and short wave infrared technologies.
-Complete procurement of Sniper Range Finder system test articles for testing and eventual selection of system for procurement.
-Initiate contract award efforts for the design and development of Dual-Channel Heavy Sight prototype system.

***FY 2018 Base Plans:***
-Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps.
-Continue prototype development and build of Dual-Channel Heavy Sight system for testing

***FY 2018 OCO Plans:***

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1901 / *MC Grnd Wpnry Prod Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Family of Infantry Weapons Systems (FIWS) | 2.553 | 1.409 | 1.306 | 0.000 | 1.306 |
| ***Articles:*** | - | - | - | - | - |

***Description:*** Family of Infantry Weapons Systems (FIWS) is a program that provides for continuous monitoring, research and development, assessment of and implementation of Joint Service and USMC unique system modifications. Efforts such as: sustain weapon capability, enhance Gunner's Protection Kits (GPK) and/or improve the performance, maintainability, supportability, service life, ergonomics, and safety enhancements of Infantry Weapons Systems.

***FY 2016 Accomplishments:***
-Continued Product Improvement Program testing for various emergent requirements.
-Continued efforts to analyze, design, develop, and field modifications for Infantry Weapons (to include Gunner's Protection Kits).
-Continued performance evaluation on various types of ammunition currently under development.
-Initiated product improvement of GPK in order to meet requirements outlined in the GPK Requirements Memorandum.
-Initiated efforts to analyze, design, and develop a GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.
-Initiated effort to lighten Sniper Rifles.

***FY 2017 Plans:***
-Continue Product Improvement Program testing for various emergent requirements.
-Continue efforts to analyze, design, develop, and field modifications (to include GPKs).
-Continue performance evaluation of various types of ammunition currently under development.
-Continue product improvement of GPK in order to meet requirements outlined in Requirements Memorandum for GPK.
-Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.
-Continue product improvements on Sniper and Special Purpose Weapons and ancillary equipment and ammo.

***FY 2018 Base Plans:***
-Continue Product Improvement Program testing for various emergent requirements.
-Continue efforts to analyze, design, develop, and field modifications (to include GPKs).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1901 / *MC Grnd Wpnry Prod Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue performance evaluation of various types of ammunition currently under development.<br>-Continue product improvement of GPK in order to meet requirements outlined in Requirements Memorandum for GPK.<br>-Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels.<br>-Continue product improvement of Sniper and Special Purpose systems and ancillary support equipment in order to meet established or emerging requirements.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Company and Battalion Mortars | 0.721 | 0.494 | 0.399 | 0.000 | 0.399 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This funding is used to provide system development and demonstration efforts and pre-Milestone C activities, for the Next Generation of Lightweight Handheld Mortar Ballistic Computer (LHMBC) software and hardware integration. Funding also supports development of system upgrades for the 60mm and 81mm mortar and associated equipment.<br>***FY 2016 Accomplishments:***<br>-Continued system and software development and demonstration efforts.<br>-Continued pre-Milestone C activities.<br>***FY 2017 Plans:***<br>-Continue system and software development, and demonstration efforts.<br>-Continue pre-Milestone C activities (including Developmental Testing).<br>-Initiate testing and evaluation of candidate systems for Company and Battalion Mortars, and for the development of software for LHMBC.<br>***FY 2018 Base Plans:***<br>-Complete system and software development, and demonstration efforts.<br>-Complete Milestone C activities.<br>-Purchase NDI for testing and evaluation of candidate systems and modifications for Company and Battalion Mortars, and for the development of software for LHMBC.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>1901 / *MC Grnd Wpnry Prod Improvement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.155 | 3.689 | 3.512 | 0.000 | 3.512 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTEN/2319 - MPM: *Mission Payload Module-Joint Non-Lethal Weapons Directorate* | 6.826 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/2208: *Escalation of Force - Equip (EoF-E)* | 0.449 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 54.349 |
| • PMC/4930: *Combat Optics* | 1.680 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1,505.448 |
| • PMC/2220-01: *Family of Infantry Weapons Systems* | 1.721 | 5.247 | 5.331 | - | 5.331 | 17.505 | 17.432 | 5.396 | 5.500 | Continuing | Continuing |
| • PMC/2220-02: *Company and Battalion Mortars* | 6.124 | 0.000 | 0.810 | - | 0.810 | 3.339 | 3.407 | 3.474 | 3.543 | Continuing | Continuing |
| • RDTEN/2319 - OI: *Ocular Interruption-Joint Non-Lethal Weapons Directorate* | 1.608 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.984 |
| • PMC/4620: *Combat Optics* | 0.000 | 11.572 | 12.793 | - | 12.793 | 9.355 | 9.554 | 9.742 | 9.942 | Continuing | Continuing |
| • PMC/2220-03: *Escalation of Force - Equip (EoF-E)* | 0.000 | 1.898 | 1.748 | - | 1.748 | 1.398 | 1.426 | 1.454 | 1.483 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

These programs range from off-the-shelf modifications to developmental items for safety, reliability, and technology upgrades to meet Marine Corps requirements.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2086 / *Soldier/Marine Enhancement* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2086: *Soldier/Marine Enhancement* | 28.447 | 2.140 | 3.140 | 3.340 | - | 3.340 | 4.707 | 4.251 | 3.992 | 4.069 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Marine Expeditionary Rifle Squad (MERS) mission is to manage the infantry squad, "squad as a system", by conducting integration, systems engineering, human factors, and modernization efforts across all the products that are worn, carried, and consumed by the rifle squad. Physical integration, capability analysis, modeling and simulation, ergonomics, and usability assessments are facilitated by this program in working with the various program managers and project officers in the development of their unique items that contribute to the squads overall capabilities. MERS operates and manages the Gruntworks Squad Integration Facility, including facilities sustainment, restoration and modernization of the facility, to meet mission requirements in order to support integration and assessments of equipment. MERS is engaging industry and academia in search of innovative technologies that can enhance infantry capabilities via a Partnership Intermediary Agreement. Weight and volume management are fundamental considerations in the insertion or modernization of any squad equipment. MERS works with Joint and NATO soldier modernization programs to harvest new technologies to increase the capability of the rifle squad. The program also ensures the integration of the rifle squad into the various mobility platforms currently in service and being developed to ensure a Marine and his equipment can operate effectively. This program is essential to ensure the combined synergistic equipment effects enhance the war-fighting functions of the Marine rifle squad towards the strategic Marine Corps war fighting vision for the future.

Ammunition Life Cycle Management Program responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development IPT (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition will likely decrease as the Marine Corps draws down and we end our participation in OEF, ammunition logistics R&D projects designed to extend the shelf life of our current inventory, provide enhanced packaging to protect our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain a reliable conventional ammunition inventory into the future.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Marine Expeditionary Rifle Squad (MERS) | 1.665 | 2.441 | 2.731 | 0.000 | 2.731 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The increase from FY17 to FY18 of $.0290M supports continued investments in MERS Infantry Working Group prioritized projects. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2086 / *Soldier/Marine Enhancement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continued to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.<br>-Continued to resource, improve, and utilize the Gruntworks Squad Integration Facility as an asset to execute integration projects, prototyping, and usability trials.<br>-Continued to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics.<br>-Continued to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level.<br>-Continued to support integration of body armor and load bearing systems with human factors expertise.<br>-Continued to conduct mobility experiments using the Marine Corps Load Effects Assessment Program.<br>-Continued to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.<br>-Continued to conduct R&D on squad systems in conjunction with Army squad system projects.<br>-Continued to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.<br>-Continued to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.<br>-Continued to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability.<br>-Continued to seek weight and volume reduction replacements for current infantry equipment that support integration of components.<br>-Continued to implement capability requirements from MERS Initial Capabilities Document (ICD). | | | | | |
| ***FY 2017 Plans:***<br>-Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.<br>-Continue to resource, improve, and utilize the Gruntworks Squad Integration Facility as an asset to execute integration projects, prototyping, and usability trials.<br>-Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics, and evaluate mobility attributer.<br>-Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level.<br>-Continue to support integration of body armor and load bearing systems with human factors expertise. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2086 / *Soldier/Marine Enhancement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program.<br>-Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.<br>-Continue to conduct R&D on squad systems in conjunction with Army squad system projects.<br>-Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.<br>-Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.<br>-Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability.<br>-Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components.<br>-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD).<br>-Initiate ability to rapidly evaluate innovative technologies with industry and academia. Prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as a mediation to pursue innovation and technology. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.<br>-Continue to resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold.<br>-Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&D integration projects, prototyping, rapid assessment of technologies, and usability trials.<br>-Continue investment into Gruntworks Squad Integration Facility enablers and capabilities.<br>-Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics.<br>-Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level.<br>-Continue to support integration of body armor and load bearing systems with human factors expertise. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2086 / *Soldier/Marine Enhancement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents.<br>-Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms.<br>-Continue to conduct R&D on squad systems in conjunction with Army squad system projects.<br>-Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment.<br>-Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment.<br>-Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability.<br>-Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components.<br>-Continue to implement capability requirements from MERS Initial Capabilities Document (ICD).<br>-Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Ammunition Life Cycle Management | 0.475 | 0.699 | 0.609 | 0.000 | 0.609 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Initiated R&D efforts for the Retrograde Pallet Box, Ammunition Packaging Layer Elimination Study, Phosphine Indicator, and the small arms muzzle flash testing. These projects will enhance the readiness and safety for ammunition and explosives.<br>***FY 2017 Plans:***<br>-Continue to support the Ammunition Logistics R&D IPT by funding the Phosphine Indicator project in support of 81mm<br>Red Phosphorus mortars and the 155mm ExpressPak reusable pallet system. Funds will also support all facets of ammunition related research, development, studies, test and evaluation, product improvement efforts performed by contractors and government installations, including procurement of end items, weapons, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2086 / *Soldier/Marine Enhancement* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| equipment, components, ammunition, materials and services requirement for development of ammunition related equipment, material, or computer application software.<br>***FY 2018 Base Plans:***<br>-Continue to support the Ammunition Logistics R&D IPT by funding the Propellent Temperature project, Emergency<br>resupply project, thermoformed dunnage project, site planning project, and the Logistics Study for AM (3D) printing<br>project.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.140 | 3.140 | 3.340 | 0.000 | 3.340 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Non Developmental Item/Commercial off the Shelf (NDI/COTS).

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2237 / *Amphibious Vehicle Test* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2237: *Amphibious Vehicle Test* | 3.164 | 6.324 | 0.991 | 2.861 | - | 2.861 | 2.833 | 2.897 | 2.963 | 3.025 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Amphibious Vehicle Test Branch (AVTB) is a component of Marine Corps Systems Command (MCSC) and is responsible for the operation and management of their test facility, which is the Department of Defense's only certified amphibious vehicle test capability. The AVTB is responsible for the generation of test plans, executes, analyzes and reports results of developmental and integrated test and evaluation events. They predominately supporting the development and performance validation of amphibious and ground combat vehicle system capabilities. AVTB conducts and supports testing for the MCSC; Navy PEOs and Program Management Offices; the Office of Naval Research; and HQMC PP&O and CD&I, as directed. The AVTB mission is to plan, execute, analyze and report developmental and integrated test and evaluation of USMC and Joint Service tracked, wheeled and ground combat vehicles and other demonstration events in order to characterize the performance of amphibious and ground combat vehicle systems and enable informed acquisition decisions for the future warfighting capabilities.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Contracts and Test and Evaluation Support Assets | 6.324 | 0.991 | 2.861 | 0.000 | 2.861 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The $1.870M increase from FY17 to FY18 reflects increased test support for the Amphibious Combat Vehicle and Assault Amphibious Vehicle beginning in FY18. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Continued LAV variant water testing. | | | | | |
| -Continued to maintain operations and facilities fully functional and provide technical expertise to ONR's Exercise Trident Warrior; and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions. | | | | | |
| -Completed HTR testing | | | | | |
| -Completed ACV inc 1.1 Reliability Growth Testing (RGT), Survivability, Human Factors, C2, Water mode Operational Assessments, and support the ACV design development and technology risk reduction efforts. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2237 / *Amphibious Vehicle Test* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Completed AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade.<br>***FY 2017 Plans:***<br>-Continue ACV inc 1.1 DT&E water testing<br><br>-Continue LAV variant water testing.<br><br>-Continue AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade.<br><br>-Continue to provide resources and technical expertise to ONR's Exercise Trident Warrior; and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions.<br>***FY 2018 Base Plans:***<br>-Continue ACV inc 1.1 DT&E water testing<br><br>-Continue LAV variant water testing.<br><br>-Continue AAV baseline and survivability upgrade DT&E RGT with increase focus testing to inform the upgrade acquisition and contracting process for survivability upgrade.<br><br>-Continue to provide resources and technical expertise to ONR's Exercise Trident Warrior.<br><br>-Continue to resource operating costs and provide test support to other MCSC, Navy PEOs, and Joint Service acquisitions.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 6.324 | 0.991 | 2.861 | 0.000 | 2.861 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2237 / *Amphibious Vehicle Test* |

**C. Other Program Funding Summary ($ in Millions)**

**Remarks**

**D. Acquisition Strategy**

Work will be led in-house by the Amphibious Vehicle Test Branch (AVTB). As DoD's only certified amphibious test and evaluation capability, AVTB will provide technical and user information regarding the performance of amphibious and ground combat vehicles during developmental testing, capabilities demonstrations and assessments, integrated and follow-on test evaluations events for Marine Corps and Joint Service Program Managers of system activities to support future warfighting capabilities. Required DT&E test assets will be resourced organically with military and civilian personnel, and as required contracted by the MCSC, such as boat operations and maintenance, professional data collection and reduction, test instrumentation and test-peculiar programming and technical writing.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2315 / *Training Devices/Simulators* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2315: *Training Devices/ Simulators* | 118.038 | 11.848 | 17.183 | 23.927 | - | 23.927 | 16.882 | 19.481 | 22.356 | 19.791 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

NOTE: The overall increase of $6.744M from FY17 to FY 18 is attributable to: increased support for FoFTS development and integration activities for enhancements to instrumentation systems; DVTE Virtual Battle Space (VBS) software development improvements and upgrades; MTWS Reengineering baseline software and FoFTS development and integration activities; RTAM continuous support of TVCS Mobile enhancements; and the SAVT requirement to move into the capability arena to inter-operate with other training devices.

**A. Mission Description and Budget Item Justification**

(U) Training simulators supported by this program element include Combined Arms Command & Control Training Upgrade System (CACCTUS), Deployable Virtual Training Environment (DVTE), Force on Force Training Systems (FoFTS), Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements, Ranges and Training Area Management (RTAM) [Formerly Range Modernization/Transformation], Supporting Arms Virtual Trainer (SAVT), Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)], and Training Support. These training systems provide tactical weapons and decision-making skill training from entry level through MAGTF staff level. Systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective and timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, and define operational requirements.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Combined Arms Command and Control Trainer Upgrade System (CACCTUS) | 6.672 | 6.603 | 5.719 | 0.000 | 5.719 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** CACCTUS is a combined arms staff training system that when fully fielded will enable comprehensive Marine Corps staff, unit, and team training both at home station Combined Arms Staff Training (CAST) facilities and through Distributed training involving CAST facilities across the Marine Corps. CACCTUS is an upgrade to the USMC's CAST that provides fire support training for the Marine Air Ground Task Force (MAGTF) elements up to and including Marine Expeditionary Brigade (MEB) level. Using the system components and simulation capabilities, two dimensional (2D)and three dimensional (3D) visuals, interfaced Command, Control, Communications, Computers and Intelligence (C4I),synthetic terrain, and an After Action Review (AAR), the concept of operations for the CACCTUS system is to immerse the trainees in a realistic, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| scenario-driven environment to enable commands and their battle staffs to train or rehearse combined arms tactics, techniques and procedures for decision-making processes. | | | | | |
| ***FY 2016 Accomplishments:***<br>- Continued Acquisition Program Engineering support.<br>- Completed and fielded version 6.0.4 which included additional virtualization efforts.<br>- Completed development of first phase of Distributed Ops<br>- Continued development of warfare specific software applications in support of Battalion Regimental staffs to Marine Expeditionary Brigade (MEB) training requirements.<br>- Continued development of After Action Review (AAR) functionality.<br>- Continued development of new architecture to support maturing hardware platforms.<br>- Initiated integration of new 3D viewer software | | | | | |
| ***FY 2017 Plans:***<br>- Continue Acquisition Program engineering support.<br>- Continue development of phase 2 Distributed Ops.<br>- Continue integration of new 3D viewer software.<br>- Continue development of After Action Review (AAR) functionality.<br>- Continue development of new architecture to support maturing hardware platforms.<br>- Initiate development of software to support centralized system architecture.<br>- Initiate transition to new system communication environment.<br>- Initiate new C4i interoperability. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue Acquisition Program engineering support.<br>- Continue integration of new 3D viewer software.<br>- Continue additional training system interoperability to include new C4i devices.<br>- Continue development of After Action Review (AAR) functionality.<br>- Continue development of software to support centralized system architecture.<br>- Continue transition to new system communication environment.<br>- Complete development of new architecture to support maturing hardware platforms.<br>- Complete development of Distributed Ops. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Force on Force Training Systems (FoFTS)<br>***Articles:*** | 0.000<br>- | 0.250<br>- | 1.914<br>- | 0.000<br>- | 1.914<br>- |
| ***Description:*** FoFTS provides realistic, non-live-fire capabilities to perform force-on-force training and supports realistic, live-fire force-on-target training. The program develops, fields, and supports for a suite of tactical engagement systems that allow Marines to receive feedback in non-live fire FOF training by using low velocity projectiles or advanced, instrumented, laser-based tactical engagement systems.<br><br>NOTE: The $1.664M increase from FY17 to FY18 reflects funds for development and integration activities for enhancements of additional Force on Force instrumentation systems.<br><br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Initiate the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators.<br>- Initiate testing for blank fire of AK-47.<br>- Initiate Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements.<br>***FY 2018 Base Plans:***<br>- Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators.<br>- Continue Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements.<br>- Complete testing for blank fire of AK-47.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Deployable Virtual Training Environment (DVTE)<br>***Articles:*** | 0.558<br>- | 2.075<br>- | 2.369<br>- | 0.000<br>- | 2.369<br>- |
| ***Description:*** DVTE is a laptop Personal Computer (PC) based simulation system capable of emulating organic and supporting Infantry Battalion weapons systems and training scenarios to facilitate training and readiness based training. Its portable configuration allows Marines to train in areas where there are few options for training | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| in garrison, aboard ship, at remote reserve locations, and deployed. DVTE training includes language and culture training, platoon and squad level tactics, employment of supporting arms, and various Recognition of Combatants (ROC) packages. DVTE is part of a Commander's "training toolkit" contributing to the building block approach to standards based training focusing on achieving an improved level of combat readiness.<br><br>NOTE: The increase in RDTE funding from FY17 to FY18 is due to DVTE development for Virtual Battle Space (VBS) to support the warfighter virtual training improvements and upgrades.<br><br>***FY 2016 Accomplishments:***<br>- Continued incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.<br>- Continued the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events.<br>- Initiated development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.<br>- Initiated action to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release.<br>- Initiated enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.<br>***FY 2017 Plans:***<br>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.<br>- Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events.<br>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.<br>- Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.<br>***FY 2018 Base Plans:***<br>- Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan.<br>- Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability to replace/decrease actual live training events.<br>- Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release.<br>- Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release.<br>- Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements<br>***Articles:***<br><br>***Description:*** The MAGTF Tactical Warfare Simulation (MTWS) is the Marine Corps' only constructive, aggregate-level simulation system used to support the training of Marine commanders and their battle staffs in MAGTF war-fighting principles/concepts and associated command and control procedures. Using complex computer-simulated behavior models, MTWS provides an interactive, decision-based, real-time, war game representing the six war-fighting functional areas of fires, command and control, force protection, logistics, maneuver, and intelligence. It's modeling breadth and flexibility enables users to represent and exercise a wide variety of combat scenarios to prepare leaders to face the military challenges of today's world. MTWS is designed to support the training of commanders and their staffs in exercises involving live and simulated land, air, and naval forces at all operational command levels. The system supports all levels of command throughout the Marine Expeditionary Force (MEF) and Joint Task Force (JTF). MTWS can be used as a multi-sided war game, including red, blue, civilian, and non-aligned sides. The system can also be used to validate specific operational plans against a variety of enemy and environmental situations. Thus command personnel may examine alternative tactical solutions on a "what if" basis. | 2.029<br>- | 3.084<br>- | 7.757<br>- | 0.000<br>- | 7.757<br>- |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| NOTE: The reason for increase in RDTE funding from FY17 to FY18 is due to MTWS re-engineering of software baseline.<br><br>***FY 2016 Accomplishments:***<br>- Continued interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.<br>- Continued development to increase levels of software capability to meet the changing operational environment that Marines fight in daily.<br>- Initiated Live, Virtual and Constructive (LVC) simulation integration.<br><br>***FY 2017 Plans:***<br>- Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.<br>- Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily.<br>- Continue Live, Virtual and Constructive (LVC) simulation integration.<br><br>***FY 2018 Base Plans:***<br>- Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation.<br>- Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily.<br>- Continue Live, Virtual and Constructive (LVC) simulation integration.<br>- Initiate contractual efforts to re-engineer the MTWS software baseline.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Ranges and Training Area Management (RTAM) [formerly Range Modernization/Transformation (RM/T)]<br>***Articles:***<br><br>***Description:*** Ranges and Training Area Management (RTAM) developments are associated with modernizing live training ranges at major USMC bases and stations. This development effort enhances After Action Review (AAR) with ground truth feedback, realistic representation of Opposing Forces (OPFOR), and will upgrade the | 0.942<br>- | 0.783<br>- | 1.101<br>- | 0.000<br>- | 1.101<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| range and exercise control capabilities. RM/T integrates Live, Virtual, and Constructive training technologies, thereby, enhancing fielded live-fire, force-on-target, and force-on-force training capabilities.<br><br>NOTE: The $0.318M increase in RDTE funding from FY17 to FY18 supports continuance of TVCS Mobile enhancements.<br><br>***FY 2016 Accomplishments:***<br>- Continued to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems.<br>***FY 2017 Plans:***<br>- Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems.<br>- Initiate enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon)<br>- Initiate enhancements Tactical Video Capture System (TVCS) Mobile (RISCon)<br>***FY 2018 Base Plans:***<br>- Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems.<br>- Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon)<br>- Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Supporting Arms Virtual Trainer (SAVT)<br>***Articles:***<br><br>***Description:*** The SAVT will advance the training capability, operational readiness, and tactical proficiency of USMC Joint<br>Terminal Attack Controllers (JTACS), Forward Observers (FOs), and Forward Air Controllers (FACs). The personnel will use training scenarios that require the placement of tactical ordnance on selected targets using Joint Close Air Support | 0.000<br>- | 0.000<br>- | 2.203<br>- | 0.000<br>- | 2.203<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| (JCAS) procedures and observed fire procedures for Naval Surface Fire Support (NSFS),artillery and mortar fire to perform destruction, neutralization, suppression, illumination/coordinated illumination, interdiction and harassment fire missions.<br><br>NOTE: The $2.203M increase from FY17 to FY18 funds the requirement to move the SAVT into the capability arena to inter-operate with other training devices in the Live Virtual Constructive (LVC) mode. SAVT will be required to operate at a Mission Assurance Category (MAC) III level to incorporate the required security classification.<br><br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate and complete development and integration of Battlefield effects and aircraft behaviors software.<br>- Initiate and complete information Assurance and networkability in order to interoperate with other Simulations in Live Virtual Constructive (LVC).<br>- Initiate and complete enhancements of command features and flight models.<br>- Initiate and complete development and integration of Fixed and Rotary Wing flight profiles.<br>- Initiate and complete post engineer support and developmental installation and operational testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)]<br>***Articles:***<br><br>***Description:*** The Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)] is an integrating construct or "toolkit" of Live, Virtual and Constructive (LVC) training capabilities used to significantly improve infantry squad operational readiness and squad leader tactical decision-making skills. The collection of LVC training capabilities within SITE will enhance opportunities for squad collective training to increase tactical proficiency, confidence, and readiness for real world operations. SITE will enhance skill transfer | 1.355<br>- | 4.350<br>- | 2.829<br>- | 0.000<br>- | 2.829<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| and assessment by enabling squads to finish, test, and remediate training in preparation for a capstone exercise such as pre-deployment training.<br><br>***FY 2016 Accomplishments:***<br>- Continued to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability.<br>- Completed Training Effectiveness Evaluation events for system enhancements for Instrumented-Tactical Engagement Simulation System II (I-TESS II) Shoulder-Launched Multipurpose Assault Weapon (SMAW) and Javelin weapons, and One Tactical Engagement Simulation System (OneTESS) with Range Instrumentation Systems Exercise Controller (RISCon).<br>- Completed development efforts for the anti-armor TOW/Saber and MK19 simulated weapons systems capability.<br>- Initiated integration of Augmented Immersive Team Training (AITT) system upon completion of transition from ONR into existing programs of record.<br>- Initiated System Training Effectiveness Evaluation Event for Tube-launched Optically-tracked Wire-guided (TOW)/Saber and MK19 capability.<br>- Initiated development of the Employ Munitions capability within I-TESS II.<br><br>***FY 2017 Plans:***<br>- Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability.<br>- Continue the integration of the Augmented Immersive Team Trainer (AITT) within the OneTESS Mortar capability and produce the prototype items for testing.<br>- Complete System Training Effectiveness Evaluation Event for TOW/Saber and MK19 capability.<br>- Complete development of the Employ Munitions capability within I-TESS II.<br>- Initiate and complete the training effectiveness evaluation of the Employ Munitions development.<br>- Initiate and complete the Live and Virtual integration activities for I-TESS II with Virtual Battle Space (VBS).<br><br>***FY 2018 Base Plans:*** | | | | | |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability.<br>- Complete the integration of the AITT within the OneTESS Mortar capability and produce the prototype items for testing.<br>- Initiate virtual integration tasks for CCS, SAVT, DVTE gateways and database commonality.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Training Support<br>***Articles:***<br>***Description:*** Provide training solution development efforts for the modernization of training systems by providing high fidelity, immersive simulations and capabilities. Integrates existing live, virtual, and constructive training capabilities to provide fully coordinated Marine Air Ground Training Force (MAGTF) training exercises that realistically simulate the operating environment.<br>***FY 2016 Accomplishments:***<br>- Continued interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.<br>- Completed server virtualization testing.<br>- Initiated Live, Virtual and Constructive (LVC) simulation integration.<br>***FY 2017 Plans:***<br>- Continue interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.<br>- Continue Live, Virtual and Constructive (LVC) simulation integration.<br>***FY 2018 Base Plans:***<br>- Continue interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.<br>- Continue Live, Virtual and Constructive (LVC) simulation integration.<br>***FY 2018 OCO Plans:*** | 0.292<br>- | 0.038<br>- | 0.035<br>- | 0.000<br>- | 0.035<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 11.848 | 17.183 | 23.927 | 0.000 | 23.927 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/6532-01: *Training Devices, CACCTUS* | 1.001 | 3.515 | 4.659 | - | 4.659 | 3.909 | 3.990 | 4.067 | 4.148 | Continuing | Continuing |
| • PMC/6532-02: *Training Devices, RTAM* | 7.150 | 14.766 | 19.481 | - | 19.481 | 31.790 | 26.974 | 27.759 | 28.583 | Continuing | Continuing |
| • PMC/4630: *Common Computer Resources, MTWS* | 0.786 | 0.724 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/6532-03: *Training Devices, SAVT* | 0.000 | 4.061 | 4.212 | - | 4.212 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 8.273 |
| • PMC/6532-04: *Training Devices, DVTE* | 0.000 | 2.229 | 2.538 | - | 2.538 | 1.447 | 1.476 | 4.076 | 4.158 | Continuing | Continuing |
| • PMC/6532-05: *Training Devices, Force on Force Training Systems* | 0.000 | 3.400 | 7.456 | - | 7.456 | 8.853 | 9.098 | 9.277 | 9.463 | 0.000 | 47.547 |
| • PMC/6532-06: *Training Devices, Immersive Training Range Support/SITE* | 0.000 | 0.000 | 25.012 | - | 25.012 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 25.012 |
| • PMC/6532-07: *Training Devices, MTWS* | 0.000 | 0.000 | 0.904 | - | 0.904 | 0.752 | 0.765 | 0.779 | 0.795 | 0.000 | 3.995 |

**Remarks**

**D. Acquisition Strategy**

(U) CACCTUS - MIPRs to Army and exercise task orders on competitive contract (C/IDIQ).
(U) DVTE - Exercise task orders off of new sole source IDIQ for Virtual Battleship Space (VBS) Software (SW) Development.
(U) MTWS - Exercise task orders off of IDIQ contract awarded December 2016, period of performance is January 2017 - December 2017.
(U) RTAM - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.
(U) SAVT - New competitive (C/FFP) contract supporting the Joint Terminal Attack Controller (JTAC) Memorandum of Agreement (MOA) awarding Base contract in July 2017 and awarding task order to support this effort in Mar 2018.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

(U) IMMERSIVE TRAINING RANGE SUPPORT (formerly SITE) - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract; and exercise option on existing MCSC RDTE contract M67854-13-C-7802 (C/FFP).
(U) Training Support - Extended existing contract 9 months in order to continue activities in support of federate status with the Joint Live Virtual Constructive (JLVC) federation v.8, and complete in-process enhancements for Ulchi Freedom Guardian-15 (UFG-15); Exercise task order on new competitive contract (C/IDIQ).
(U) FoFTS - MIPR to Army-PEO STRI for award on existing Consolidated Product-line Management contract

**E. Performance Metrics**

Program Management Reviews are conducted on all PM TRASYS programs on a quarterly basis to assess program status.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2315 / *Training Devices/Simulators* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CACCTUS - SW Dev DO 2 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.363 | 4.685 | Dec 2015 | 0.000 | | 0.500 | Dec 2017 | - | | 0.500 | Continuing | Continuing | Continuing |
| CACCTUS - SW Dev DO 4 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.000 | 1.118 | Jul 2016 | 0.000 | | 2.404 | Dec 2017 | - | | 2.404 | Continuing | Continuing | Continuing |
| CACCTUS - SW Dev DO 5 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.000 | 0.554 | Sep 2016 | 0.000 | | 2.315 | Mar 2018 | - | | 2.315 | Continuing | Continuing | Continuing |
| CACCTUS - SW Dev TO 6 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.000 | 0.000 | | 0.596 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.596 | - |
| CACCTUS - SW Dev TO 7 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.000 | 0.000 | | 2.900 | Apr 2017 | 0.000 | | - | | 0.000 | 0.000 | 2.900 | - |
| CACCTUS - SW Dev TO 8 | C/IDIQ | Riptide Software, Inc. : Oviedo, FL | 0.000 | 0.000 | | 3.107 | Aug 2017 | 0.000 | | - | | 0.000 | 0.000 | 3.107 | - |
| DVTE - SW Dev - VBS | SS/IDIQ | Bohemia Interactive : Orlando, FL | 13.255 | 0.558 | Jun 2016 | 2.075 | Jun 2017 | 2.369 | Dec 2017 | - | | 2.369 | Continuing | Continuing | Continuing |
| MTWS - SW Dev Task 2 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.415 | 1.879 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MTWS - SW Dev Task 3 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.150 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MTWS - SW Dev Task 4 | C/IDDQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.000 | | 0.096 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.096 | - |
| MTWS - SW Dev Task 6 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.000 | | 0.949 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.949 | - |
| MTWS - SW Dev Task 7 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.000 | | 0.876 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.876 | - |
| MTWS - SW Dev Task 8 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 1.341 | 0.000 | | 1.163 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 2.504 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2315 / *Training Devices/Simulators* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTWS - SW Dev Task 9 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.000 | | 0.000 | | 1.000 | Dec 2017 | - | | 1.000 | 0.000 | 1.000 | - |
| MTWS - Reengineering | C/IDIQ | RECOMPETE : TBD NEW VENDOR | 0.000 | 0.000 | | 0.000 | | 6.757 | Sep 2018 | - | | 6.757 | 0.000 | 6.757 | - |
| RTAM RISCon Development | MIPR | PEOSTRI/TRADE : Orlando, FL | 7.028 | 0.578 | Nov 2015 | 0.783 | Mar 2017 | 1.101 | Dec 2017 | - | | 1.101 | Continuing | Continuing | Continuing |
| SAVT - SW Dev | C/FFP | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 1.823 | Mar 2018 | - | | 1.823 | 0.000 | 1.823 | - |
| ITRS (SITE) - Live Core System Upgrades | C/FFP | Cubic Defense : San Diego, CA | 3.322 | 0.241 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| ITRS (SITE) - Consolidated Product Line Dev | MIPR | PEOSTRI/TRADE : Orlando, FL | 1.026 | 1.094 | Dec 2015 | 4.298 | Mar 2017 | 2.829 | Dec 2017 | - | | 2.829 | Continuing | Continuing | Continuing |
| Training Support - MTWS - SW Dev Task 2 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.002 | 0.292 | Jun 2016 | 0.000 | | 0.035 | Dec 2017 | - | | 0.035 | Continuing | Continuing | Continuing |
| Training Support - MTWS - SW Dev Task 5 | C/IDIQ | Cole Engineering Services Inc. : Orlando, FL | 0.000 | 0.000 | | 0.038 | Dec 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.038 | - |
| FoFTS SW Development | MIPR | PEOSTRI/TRADE : Orlando, FL | 0.000 | 0.000 | | 0.250 | Apr 2017 | 1.914 | Dec 2017 | - | | 1.914 | 0.000 | 2.164 | - |
| Prior Year Cumulative Funding | Various | Not Specified : Not Specified | 71.995 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 71.995 | - |
| | | **Subtotal** | 98.747 | 11.149 | | 17.131 | | 23.047 | | - | | 23.047 | - | - | - |

**Remarks**

- CACCTUS - SW Dev - Task Order awards on existing contract are expected in FY18 Q1 and Q4 for continued development.
- MTWS - SW Dev - Task Order award on existing contract is expected in FY18 Q1. Additional new competitive contract to be awarded Q4 in FY18.
- Training Support - SW Dev - Task Order award on existing contract is expected in FY18 Q1.
- SAVT - SW Dev - New competitive contract to be awarded 1st quarter FY18, with Development Task Order to award 2nd quarter FY18.
- FoFTS -SW Dev - Army-PEO STRI for award on existing Consolidated Product-line Management contract 2nd quarter FY18 continue development efforts.
- RTAM - SW Dev - Army-PEO STRI for award on existing Consolidated Product-line Management contract 2nd quarter FY18 for continue development efforts.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CACCTUS - Engineering Support | WR | NAWCTSD : Orlando, FL | 2.667 | 0.315 | Oct 2015 | 0.000 | | 0.500 | Oct 2017 | - | | 0.500 | Continuing | Continuing | Continuing |
| RTAM - SW Dev Support | WR | NAWCTSD : Orlando, FL | 0.802 | 0.364 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| SAVT - Eng Support | WR | NAWC/Zenetex, LLC. : Orlando, FL | 0.000 | 0.000 | | 0.000 | | 0.380 | Oct 2017 | - | | 0.380 | 0.000 | 0.380 | - |
| ITRS (SITE) - Travel | Various | DTS : Various | 0.023 | 0.020 | Dec 2015 | 0.052 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.095 | - |
| Prior Year Cumulative Funding | Various | Not Specified : Not Specified | 15.797 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 15.797 | - |
| | | **Subtotal** | 19.289 | 0.699 | | 0.052 | | 0.880 | | - | | 0.880 | - | - | - |

**Remarks**

- CACCTUS - Recurring Engineering Support effort TBD/Negotiated with NAWCTSD in FY18.

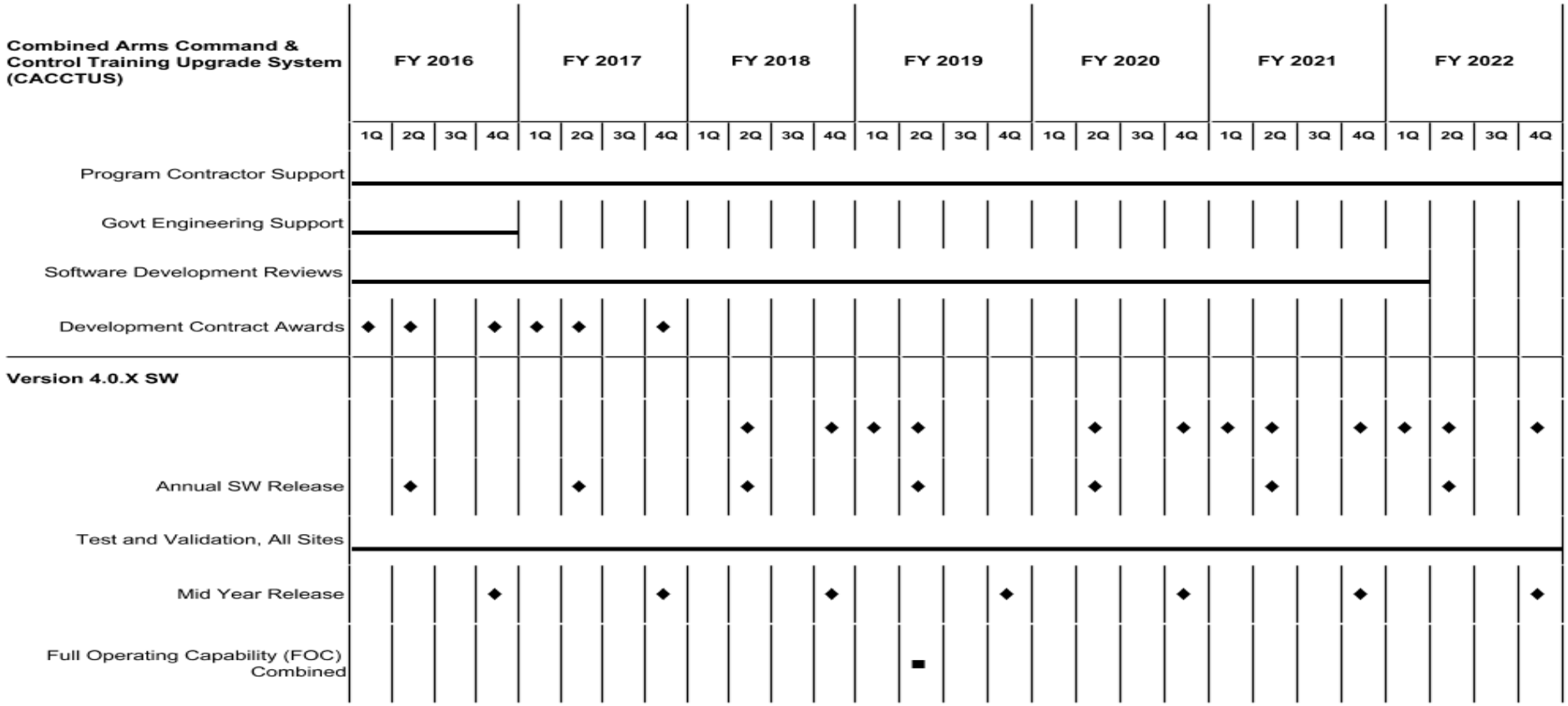
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Cumulative Funding | Various | Not Specified : Not Specified | 0.002 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.002 | - |
| | | **Subtotal** | 0.002 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.002 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 118.038 | 11.848 | | 17.183 | | 23.927 | | - | | 23.927 | - | - | - |

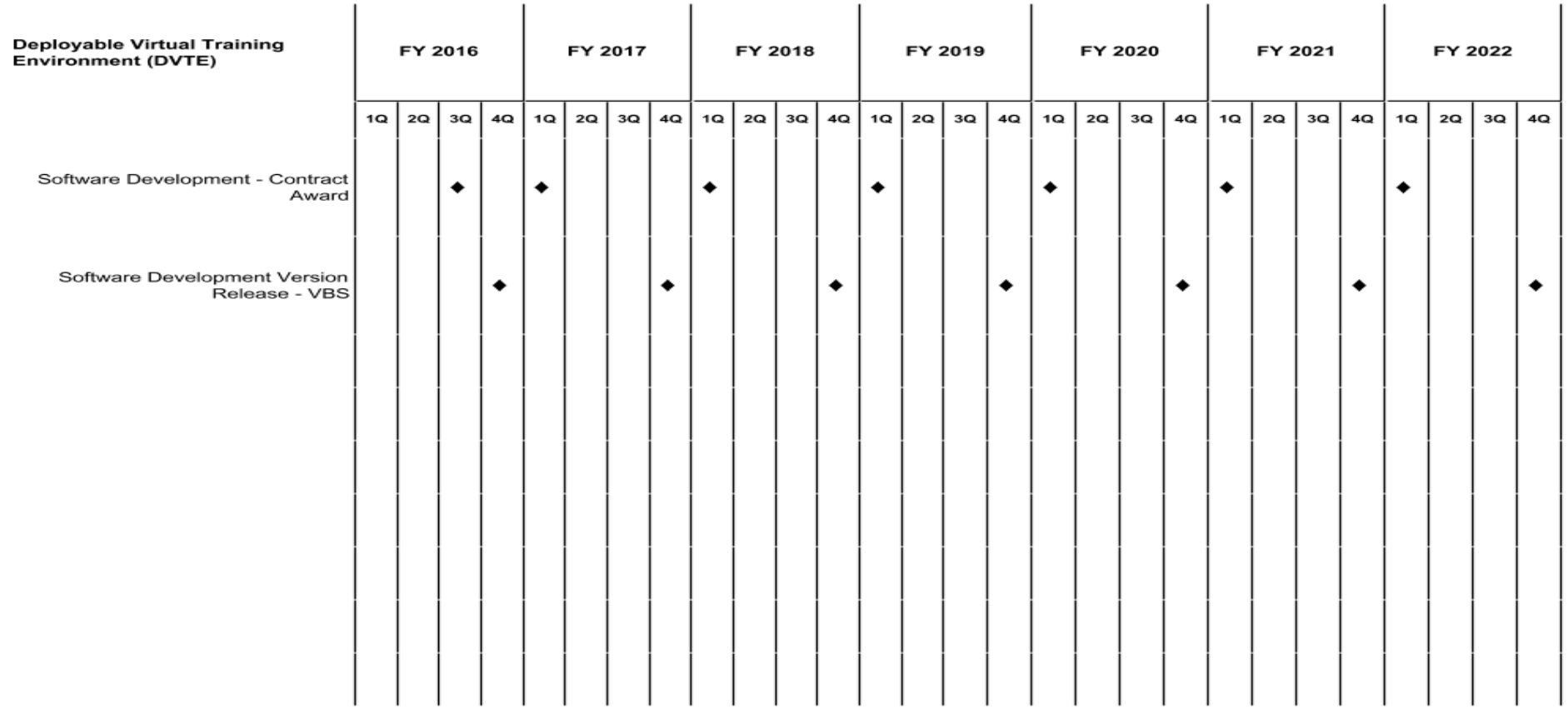
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



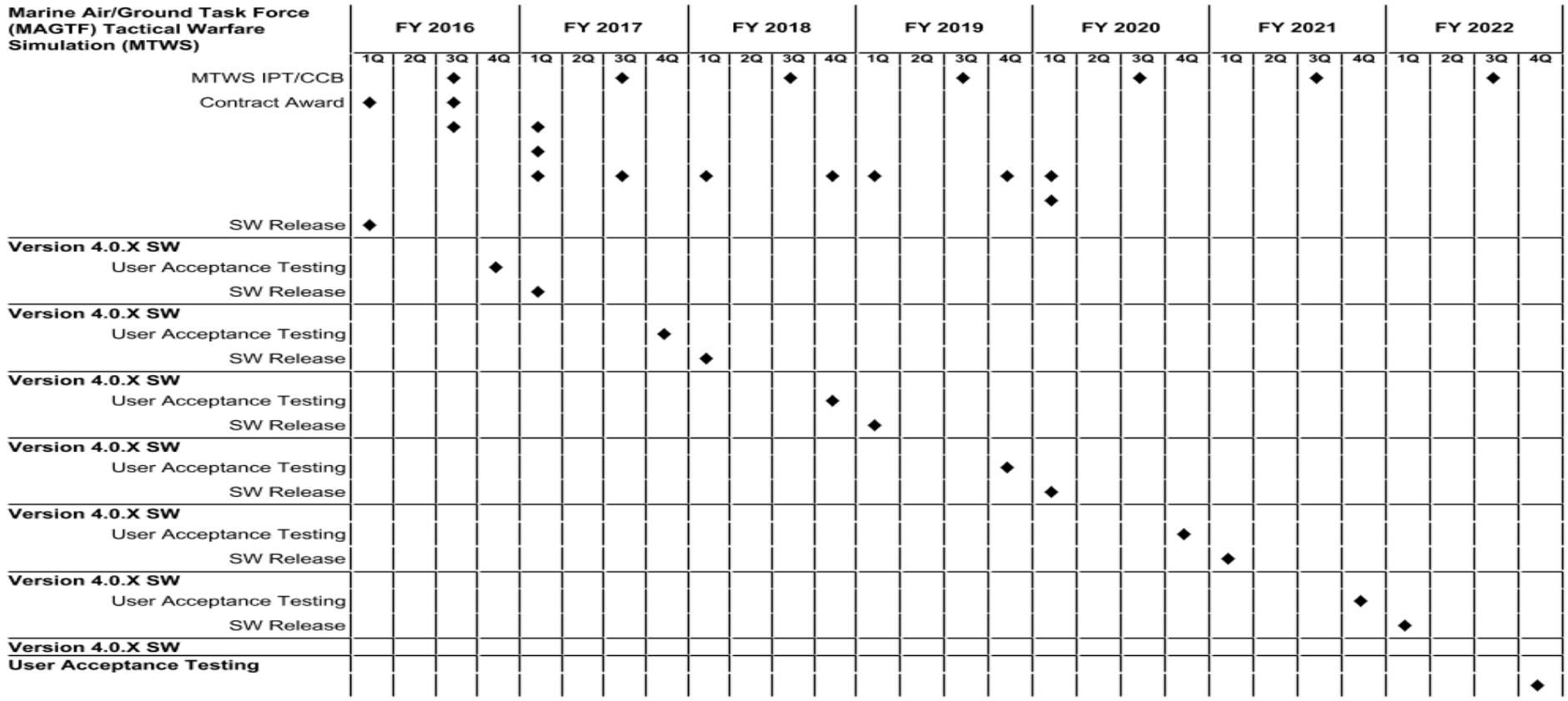

*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



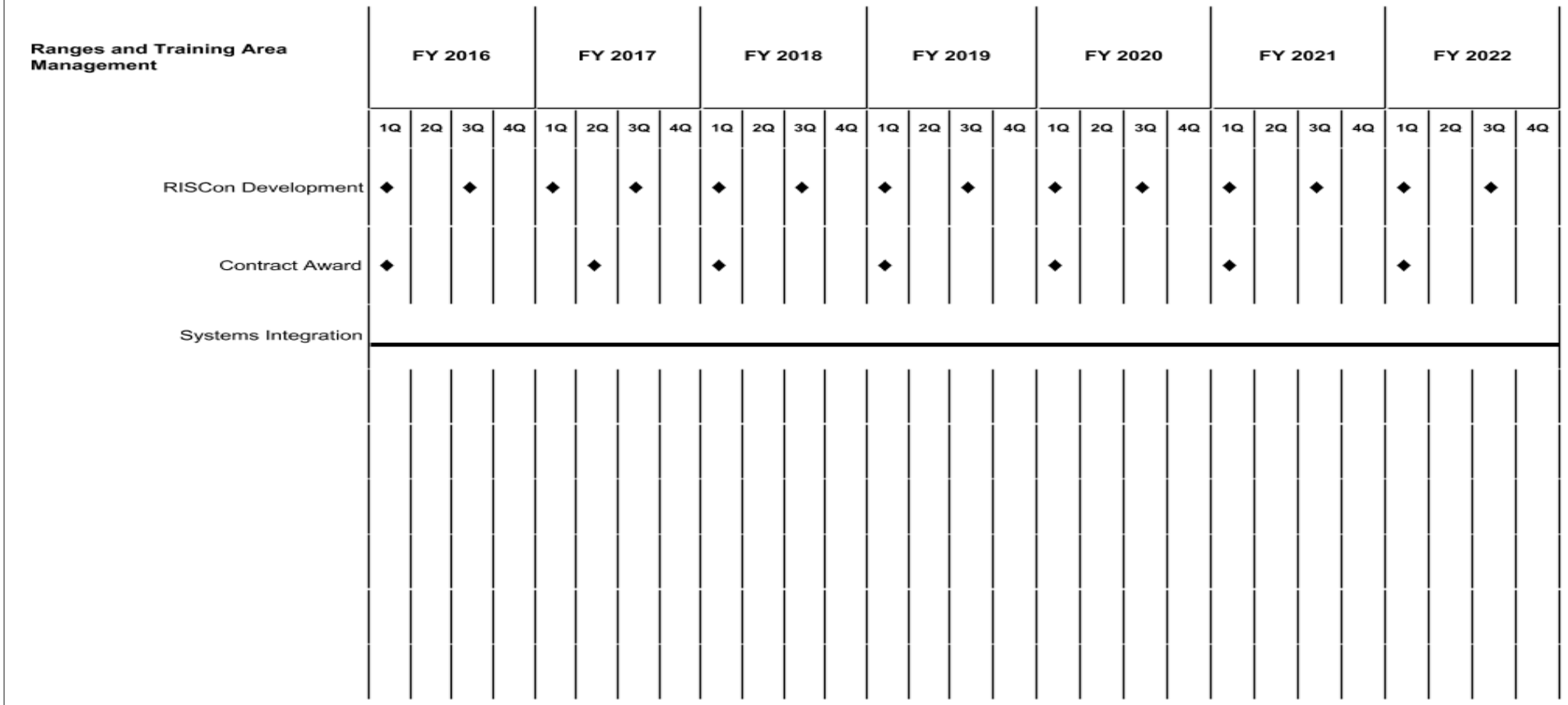

*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



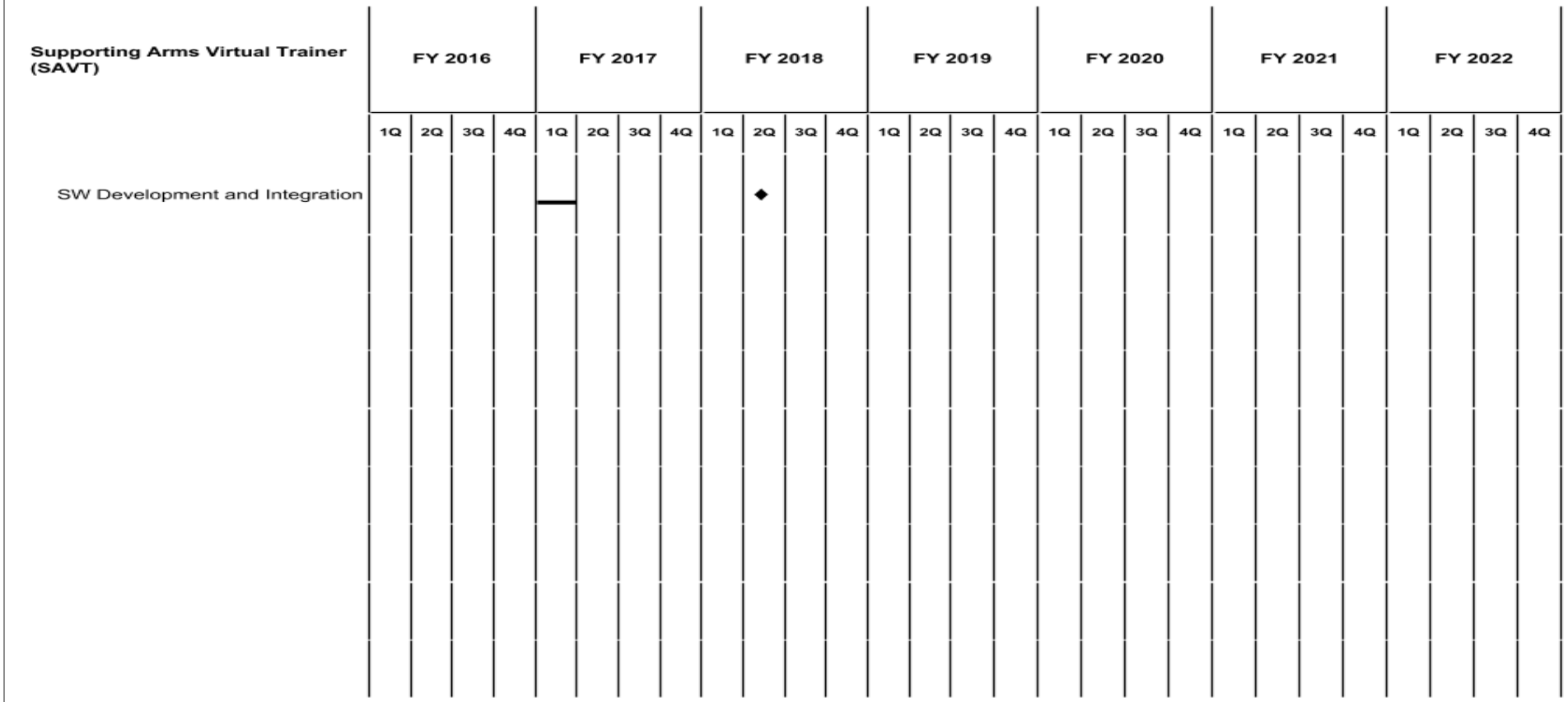

*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



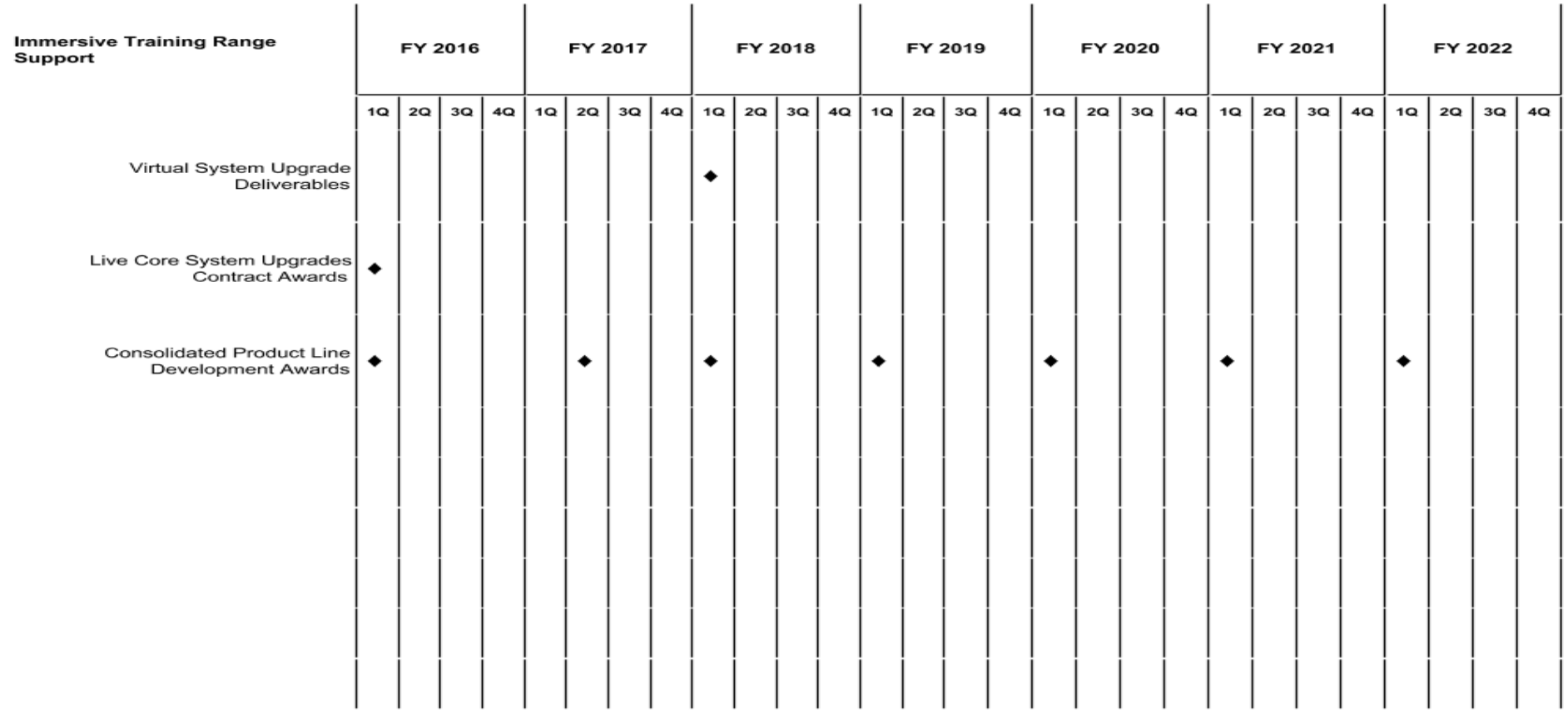

2018PB - 0206623M - 2315

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



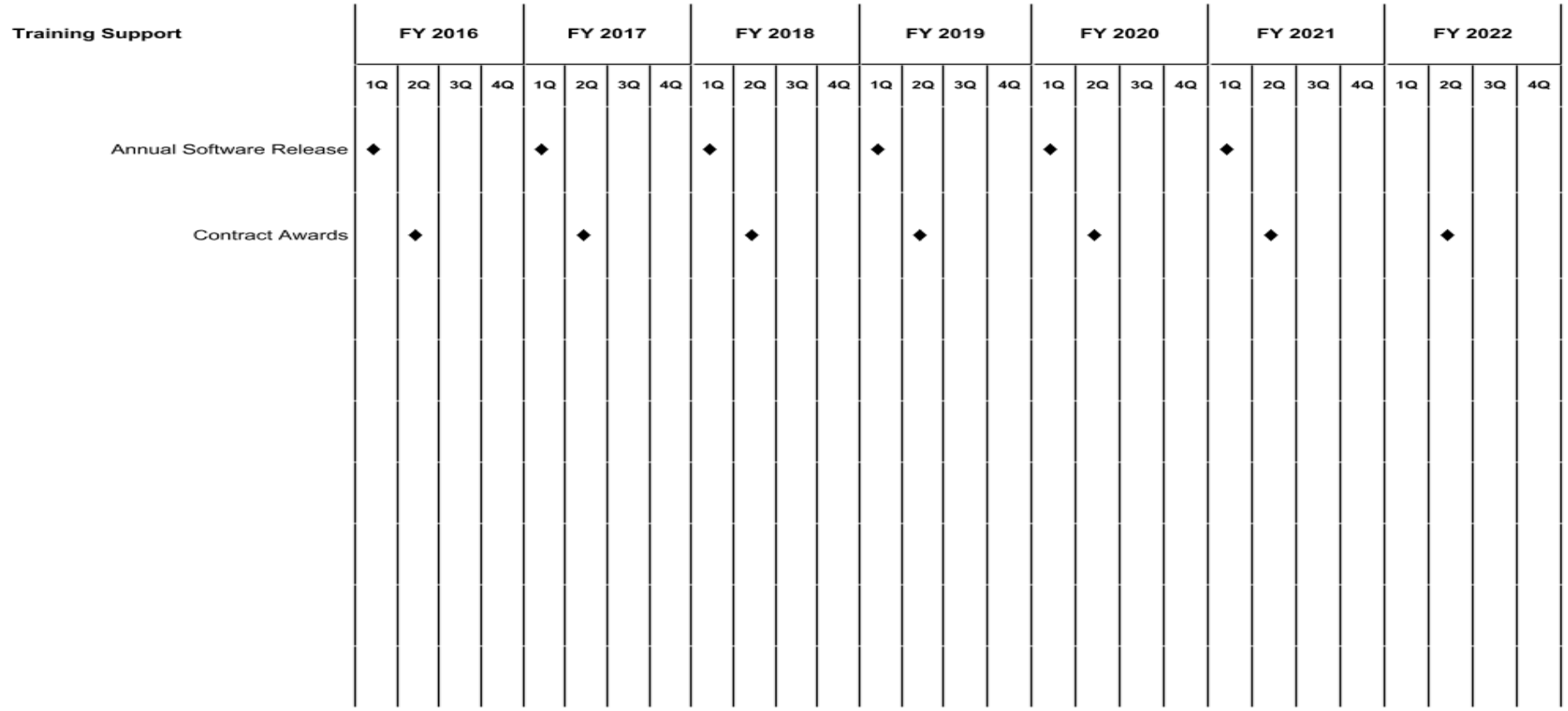

*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |



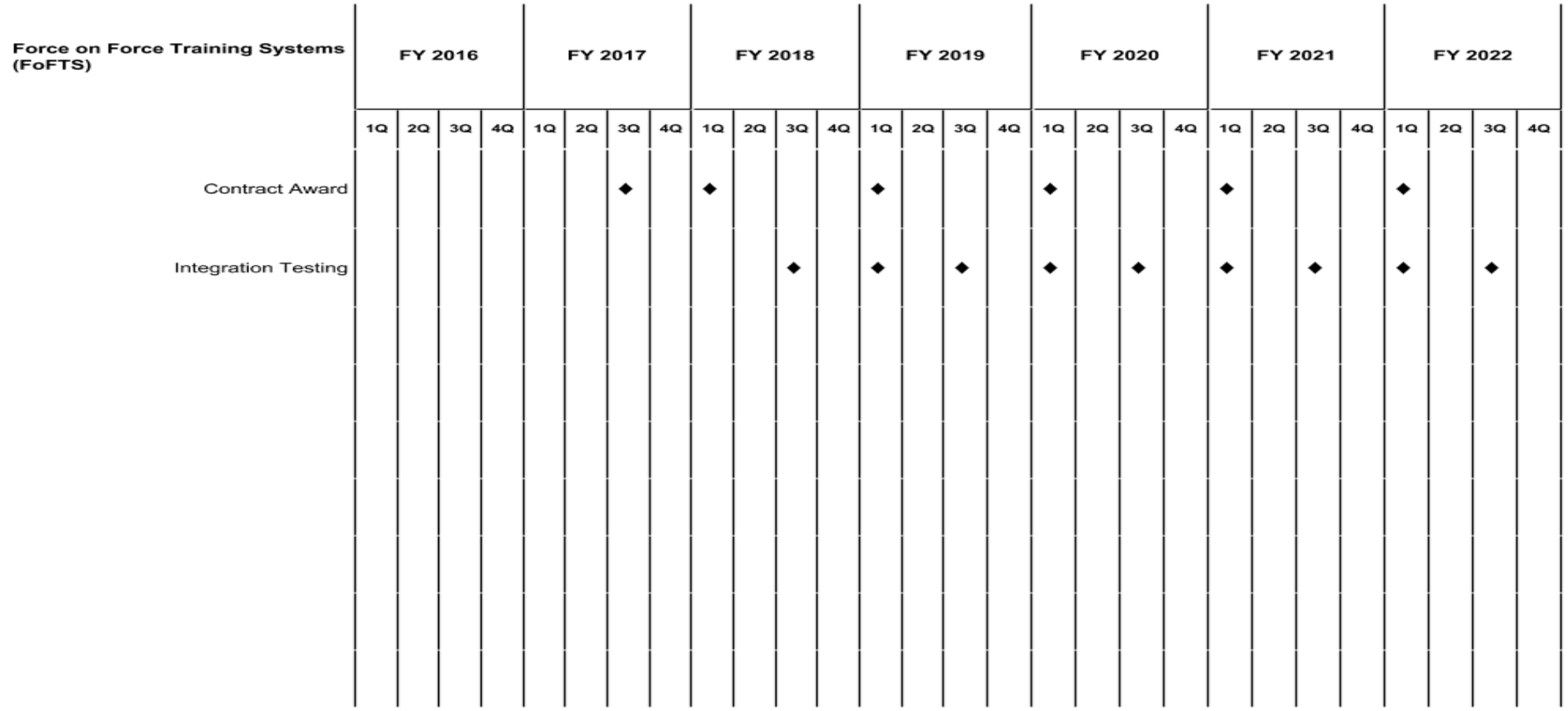

*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |




*2018PB - 0206623M - 2315*

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |




*2018PB - 0206623M - 2315*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Combined Arms Command & Control Training Upgrade System (CACCTUS)*** | | | | |
| Program Contractor Support: Program Contractor Support | 1 | 2016 | 4 | 2022 |
| Govt Engineering Support: Govt Engineering Support | 1 | 2016 | 4 | 2016 |
| Software Development Reviews: Software Development Reviews | 1 | 2016 | 1 | 2022 |
| Development Contract Awards: FY16 Award 1 | 1 | 2016 | 1 | 2016 |
| Development Contract Awards: FY16 Award 2 | 2 | 2016 | 2 | 2016 |
| Development Contract Awards: FY16 Award 3 | 4 | 2016 | 4 | 2016 |
| Development Contract Awards: FY17 Award 1 | 1 | 2017 | 1 | 2017 |
| Development Contract Awards: FY17 Award 2 & 3 | 2 | 2017 | 2 | 2017 |
| Development Contract Awards: FY17 Award 4 | 4 | 2017 | 4 | 2017 |
| Version 4.0.X SW: FY18 Award 1 | 2 | 2018 | 2 | 2018 |
| Version 4.0.X SW: FY18 Award 2 | 4 | 2018 | 4 | 2018 |
| Version 4.0.X SW: FY19 Award 1 | 1 | 2019 | 1 | 2019 |
| Version 4.0.X SW: FY19 Award 2 | 2 | 2019 | 2 | 2019 |
| Version 4.0.X SW: FY20 Award 1 | 2 | 2020 | 2 | 2020 |
| Version 4.0.X SW: FY20 Award 2 | 4 | 2020 | 4 | 2020 |
| Version 4.0.X SW: FY21 Award 1 | 1 | 2021 | 1 | 2021 |
| Version 4.0.X SW: FY21 Award 2 | 2 | 2021 | 2 | 2021 |
| Version 4.0.X SW: FY21 Award 3 | 4 | 2021 | 4 | 2021 |
| Version 4.0.X SW: FY22 Award 1 | 1 | 2022 | 1 | 2022 |
| Version 4.0.X SW: FY22 Award 2 | 2 | 2022 | 2 | 2022 |
| Version 4.0.X SW: FY22 Award 3 | 4 | 2022 | 4 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2016 | 2 | 2016 | 2 | 2016 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2017 | 2 | 2017 | 2 | 2017 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2018 | 2 | 2018 | 2 | 2018 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2019 | 2 | 2019 | 2 | 2019 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2020 | 2 | 2020 | 2 | 2020 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2021 | 2 | 2021 | 2 | 2021 |
| Version 4.0.X SW: Annual SW Release: Annual SW Release 2022 | 2 | 2022 | 2 | 2022 |
| Version 4.0.X SW: Test and Validation, All Sites: Test and Validation 1, All Sites 2016 | 1 | 2016 | 4 | 2022 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2016 | 4 | 2016 | 4 | 2016 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2017 | 4 | 2017 | 4 | 2017 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2018 | 4 | 2018 | 4 | 2018 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2019 | 4 | 2019 | 4 | 2019 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2020 | 4 | 2020 | 4 | 2020 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2021 | 4 | 2021 | 4 | 2021 |
| Version 4.0.X SW: Mid Year Release: Mid Year Release 2022 | 4 | 2022 | 4 | 2022 |
| Version 4.0.X SW: Full Operating Capability (FOC) Combined: Full Operating Capability (FOC)/Full Development (FD) | 2 | 2019 | 2 | 2019 |
| ***Deployable Virtual Training Environment (DVTE)*** | | | | |
| Software Development - Contract Award: Software Development - Contract Award 2016 | 3 | 2016 | 3 | 2016 |
| Software Development - Contract Award: Software Development - Contract Award 2017 | 1 | 2017 | 1 | 2017 |
| Software Development - Contract Award: Software Development - Contract Award 2018 | 1 | 2018 | 1 | 2018 |
| Software Development - Contract Award: Software Development - Contract Award 2019 | 1 | 2019 | 1 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Software Development - Contract Award: Software Development - Contract Award 2020 | 1 | 2020 | 1 | 2020 |
| Software Development - Contract Award: Software Development - Contract Award 2021 | 1 | 2021 | 1 | 2021 |
| Software Development - Contract Award: Software Development - Contract Award 2022 | 1 | 2022 | 1 | 2022 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2016) | 4 | 2016 | 4 | 2016 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2017) | 4 | 2017 | 4 | 2017 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2018) | 4 | 2018 | 4 | 2018 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2019) | 4 | 2019 | 4 | 2019 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2020) | 4 | 2020 | 4 | 2020 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2021) | 4 | 2021 | 4 | 2021 |
| Software Development Version Release - VBS: Software Development Version Release - VBS (2022) | 4 | 2022 | 4 | 2022 |
| ***Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)*** | | | | |
| MTWS IPT/CCB: MTWS IPT/CCB 2016 | 3 | 2016 | 3 | 2016 |
| MTWS IPT/CCB: MTWS IPT/CCB 2017 | 3 | 2017 | 3 | 2017 |
| MTWS IPT/CCB: MTWS IPT/CCB 2018 | 3 | 2018 | 3 | 2018 |
| MTWS IPT/CCB: MTWS IPT/CCB 2019 | 3 | 2019 | 3 | 2019 |
| MTWS IPT/CCB: MTWS IPT/CCB 2020 | 3 | 2020 | 3 | 2020 |
| MTWS IPT/CCB: MTWS IPT/CCB 2021 | 3 | 2021 | 3 | 2021 |
| MTWS IPT/CCB: MTWS IPT/CCB 2022 | 3 | 2022 | 3 | 2022 |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Contract Award: Contract Award New Development | 1 | 2016 | 1 | 2016 |
| Contract Award: TO 2 Award | 3 | 2016 | 3 | 2016 |
| Contract Award: TO 3 Award | 3 | 2016 | 3 | 2016 |
| Contract Award: TO 4 Award | 1 | 2017 | 1 | 2017 |
| Contract Award: TO 6 Award | 1 | 2017 | 1 | 2017 |
| Contract Award: TO 7 Award | 1 | 2017 | 1 | 2017 |
| Contract Award: TO 8 Award | 3 | 2017 | 3 | 2017 |
| Contract Award: TO 9 Award | 1 | 2018 | 1 | 2018 |
| Contract Award: Contract Award Reengineering | 4 | 2018 | 4 | 2018 |
| Contract Award: TO 10 Award | 1 | 2019 | 1 | 2019 |
| Contract Award: Contract Opt 1 Reengineering | 4 | 2019 | 4 | 2019 |
| Contract Award: TO 11 Award | 1 | 2020 | 1 | 2020 |
| Contract Award: Contract Opt 2 Reengineering | 1 | 2020 | 1 | 2020 |
| SW Release: SW Release | 1 | 2016 | 1 | 2016 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2016 | 4 | 2016 | 4 | 2016 |
| Version 4.0.X SW: SW Release: SW Release 2017 | 1 | 2017 | 1 | 2017 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2017 | 4 | 2017 | 4 | 2017 |
| Version 4.0.X SW: SW Release: SW Release 2018 | 1 | 2018 | 1 | 2018 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2018 | 4 | 2018 | 4 | 2018 |
| Version 4.0.X SW: SW Release: SW Release 2019 | 1 | 2019 | 1 | 2019 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2019 | 4 | 2019 | 4 | 2019 |
| Version 4.0.X SW: SW Release: SW Release 2020 | 1 | 2020 | 1 | 2020 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2020 | 4 | 2020 | 4 | 2020 |
| Version 4.0.X SW: SW Release: SW Release 2021 | 1 | 2021 | 1 | 2021 |
| Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2021 | 4 | 2021 | 4 | 2021 |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Version 4.0.X SW: SW Release: SW Release 2022 | 1 | 2022 | 1 | 2022 |
| User Acceptance Testing: User Acceptance Testing 2022 | 4 | 2022 | 4 | 2022 |
| ***Ranges and Training Area Management*** | | | | |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY16 | 1 | 2016 | 1 | 2016 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY16 | 3 | 2016 | 3 | 2016 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY17 | 1 | 2017 | 1 | 2017 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY17 | 3 | 2017 | 3 | 2017 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY18 | 1 | 2018 | 1 | 2018 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY18 | 3 | 2018 | 3 | 2018 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY19 | 1 | 2019 | 1 | 2019 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY19 | 3 | 2019 | 3 | 2019 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY20 | 1 | 2020 | 1 | 2020 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY20 | 3 | 2020 | 3 | 2020 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY21 | 1 | 2021 | 1 | 2021 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY21 | 3 | 2021 | 3 | 2021 |
| RISCon Development: RISCon SW Integration Testing 1st Qtr FY22 | 1 | 2022 | 1 | 2022 |
| RISCon Development: RISCon SW Integration Testing 3rd Qtr FY22 | 3 | 2022 | 3 | 2022 |
| Contract Award: Contract Award (2016) | 1 | 2016 | 1 | 2016 |
| Contract Award: Contract Award (2017) | 2 | 2017 | 2 | 2017 |
| Contract Award: Contract Award (2018) | 1 | 2018 | 1 | 2018 |
| Contract Award: Contract Award (2019) | 1 | 2019 | 1 | 2019 |
| Contract Award: Contract Award (2020) | 1 | 2020 | 1 | 2020 |
| Contract Award: Contract Award (2021) | 1 | 2021 | 1 | 2021 |
| Contract Award: Contract Award (2022) | 1 | 2022 | 1 | 2022 |
| Systems Integration: Systems Integration | 1 | 2016 | 4 | 2022 |

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| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Supporting Arms Virtual Trainer (SAVT)*** | | | | |
| SW Development and Integration: FY18 Task Order Award | 2 | 2018 | 2 | 2018 |
| SW Development and Integration: Govt Engineering Support | 1 | 2017 | 1 | 2017 |
| ***Immersive Training Range Support*** | | | | |
| Virtual System Upgrade Deliverables: Virtual System Upgrade Deliverables | 1 | 2018 | 1 | 2018 |
| Live Core System Upgrades Contract Awards: Live Core System Upgrades Contract Awards (2016) | 1 | 2016 | 1 | 2016 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2016) | 1 | 2016 | 1 | 2016 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2017) | 2 | 2017 | 2 | 2017 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2018) | 1 | 2018 | 1 | 2018 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2019) | 1 | 2019 | 1 | 2019 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2020) | 1 | 2020 | 1 | 2020 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2021) | 1 | 2021 | 1 | 2021 |
| Consolidated Product Line Development Awards: Consolidated Product Line Development (2022) | 1 | 2022 | 1 | 2022 |
| ***Training Support*** | | | | |
| Annual Software Release: Version 3.5.3 | 1 | 2016 | 1 | 2016 |
| Annual Software Release: Version 3.5.5 | 1 | 2017 | 1 | 2017 |
| Annual Software Release: Version 3.5.7 | 1 | 2018 | 1 | 2018 |
| Annual Software Release: Version 3.5.9 | 1 | 2019 | 1 | 2019 |
| Annual Software Release: Version 3.5.11 | 1 | 2020 | 1 | 2020 |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2315 / *Training Devices/Simulators* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Annual Software Release: Version 3.5.13 | 1 | 2021 | 1 | 2021 |
| Contract Awards: FY16 Award | 2 | 2016 | 2 | 2016 |
| Contract Awards: FY17 Award | 2 | 2017 | 2 | 2017 |
| Contract Awards: FY18 Award | 2 | 2018 | 2 | 2018 |
| Contract Awards: FY19 Award | 2 | 2019 | 2 | 2019 |
| Contract Awards: FY20 Award | 2 | 2020 | 2 | 2020 |
| Contract Awards: FY21 Award | 2 | 2021 | 2 | 2021 |
| Contract Awards: FY22 Award | 2 | 2022 | 2 | 2022 |
| ***Force on Force Training Systems (FoFTS)*** | | | | |
| Contract Award: FY17 Award | 3 | 2017 | 3 | 2017 |
| Contract Award: FY18 Award | 1 | 2018 | 1 | 2018 |
| Contract Award: FY19 Award | 1 | 2019 | 1 | 2019 |
| Contract Award: FY20 Award | 1 | 2020 | 1 | 2020 |
| Contract Award: FY21 Award | 1 | 2021 | 1 | 2021 |
| Contract Award: FY22 Award | 1 | 2022 | 1 | 2022 |
| Integration Testing: Integration Testing 3rd Qtr FY18 | 3 | 2018 | 3 | 2018 |
| Integration Testing: Integration Testing 1st Qtr FY19 | 1 | 2019 | 1 | 2019 |
| Integration Testing: Integration Testing 3rd Qtr FY19 | 3 | 2019 | 3 | 2019 |
| Integration Testing: Integration Testing 1st Qtr FY20 | 1 | 2020 | 1 | 2020 |
| Integration Testing: Integration Testing 3rd Qtr FY20 | 3 | 2020 | 3 | 2020 |
| Integration Testing: Integration Testing 1st Qtr FY21 | 1 | 2021 | 1 | 2021 |
| Integration Testing: Integration Testing 3rd Qtr FY21 | 3 | 2021 | 3 | 2021 |
| Integration Testing: Integration Testing 1st Qtr FY22 | 1 | 2022 | 1 | 2022 |
| Integration Testing: Integration Testing 3rd Qtr FY22 | 3 | 2022 | 3 | 2022 |

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|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2503 / *Initial Issue* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2503: *Initial Issue* | 44.483 | 1.775 | 3.462 | 4.656 | - | 4.656 | 5.336 | 4.842 | 4.492 | 4.579 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

Load Bearing and Pack Systems now includes the Waterproof bag efforts previously included under Individual Warfighting Equipment.

**A. Mission Description and Budget Item Justification**

This funding provides research, development, test and evaluation on low cost items with an emphasis on Non-Developmental Items/Commercial-Off-the-Shelf (NDI/ COTS) available items. Much of the RDT&E is conducted in coordination/concert with other services and joint organizations, and in consideration of RDT&E efforts being pursued by the other Services. Items approved for procurement will transition into Operation and Maintenance Marine Corps accounts for Infantry Combat Equipment, Family of Field Medical Equipment, Family of Shelters, and Combat Field Feeding Systems. The benefits will be reduced logistics, less weight, improved combat effectiveness, better echelon I and II care for Marines, improved individual and unit protection, expeditionary feeding platforms, tactical mobility, etc. The employment of state of the art equipment will ensure Marines are equipped and supported with the best items that technology can offer.

The Infantry Combat Equipment portfolio of capabilities encompasses Marine Corps Uniforms, Cold Weather and Mountaineering, Load Bearing and Pack Systems, and Individual Warfighting Equipment research, development and testing of enhancements, upgrades and modifications to legacy systems and new developments. Funding for this capability area leverages other Services' and governmental partners' efforts to maximize returns on investment and promote coordination and cooperation for same or similar requirements and capabilities. The objective is to equip individual Marines with uniforms and combat equipment to maximize effectiveness in every environment across the full range of military operations.

The Family of Field Medical Equipment, Family of Shelters, and Combat Field Feeding System portfolio focus is to provide state of the art medical equipment (e.g. Authorized Medical Allowance List (AMAL)/Authorized Dental Allowance List (ADAL), Enroute Care, Mobile Medical Monitors, etc.), Family of Shelters (soft wall, different frames and fabrics, etc.), and Combat Field Feeding Systems (technology insertion for the Expeditionary Field Kitchen (EFK), Modernized Tray Ration Heating System. etc.).

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Marine Corps Uniforms (MCU) | 1.114 | 0.556 | 0.590 | 0.000 | 0.590 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training.<br>- Continued testing and evaluating Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) Uniform initiatives for shade and female dress coat and skirt.<br>- Continued research on tropical uniforms and development of affordable alternative to the Marine Corps Combat Utility Uniform (MCCUU).<br>- Continued clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.<br>- Continued to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices.<br>- Continued research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items.<br>- Continued research to reduce the load the Marines are required to transport by minimizing equipment.<br>- Initiated and completed redesign of Frame Cover (Barracks Cover) used by Male and Female Marines. Previous effort was initiated as Male Dress Cap research, development, and testing. Emerging requirements incorporated the Male Dress Cap effort into larger overarching requirement for Frame Cover redesign to reduce duplication of effort. | | | | | |
| ***FY 2017 Plans:***<br>- Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training.<br>- Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB), Commandant of the Marine Corps (CMC) uniform initiatives and female Dress Blue Coat (FDBC) and skirt.<br>- Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives.<br>- Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.<br>- Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices.<br>- Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items. | | | | | |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue research to reduce the load the Marines are required to transport by minimizing equipment.<br>***FY 2018 Base Plans:***<br>- Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training.<br>- Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) uniform initiatives.<br>- Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives.<br>- Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development.<br>- Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices.<br>- Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items.<br>- Continue research on reducing the load the Marines are required to transport by minimizing equipment.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Cold Weather and Mountaineering (CWM)<br>***Articles:***<br>***Description:*** Increase in funding from FY17 to FY18 ($0.955M) supports the development efforts on the Extreme Cold Weather Boot, Intense Cold Weather Boot, ski systems, and all other components required for the cold weather environment that are in need of upgrade.<br>***FY 2016 Accomplishments:***<br>- Continued to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine.<br>- Continued to develop and field test ski systems and all components in order to further redefine stated requirements.<br>- Continued a comparative analysis of sister services clothing items (cold weather warming layers) to leverage like items and technology, minimizing sustainment cost. | 0.088<br>- | 0.827<br>- | 1.782<br>- | 0.000<br>- | 1.782<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued modernization of existing suite of equipment to incorporate equipment technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles.<br>- Continued Marine Corps Cold Weather Infantry Kit (MCCWIK) assessment and evaluation, including over the snow mobility in both skis and sleds.<br>- Completed research, development and design modifications to the Marine Corps sleep system to reduce load, increase insulation values, and maximize comfort levels.<br>- Completed Validation of a cold weather boot that would function as a ski boot and boot for non-ski borne Marines. | | | | | |
| ***FY 2017 Plans:***<br>- Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine.<br>- Continue to develop and field test ski systems and all components, to include boots and clothing, in order to further redefine stated requirements. Intent is to leverage NATO NSNs in order to procure ski systems in FY 2019.<br>- Continue the comparative analysis of sister services clothing items, including cold weather warming layers and develop a conclusion of liked items and technology in order to minimize sustainment cost.<br>- Continue modernization of existing suite of equipment to incorporate equipment technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles.<br>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) assessment and evaluation.<br>- Initiate evaluation of Extreme Cold Weather boots and Intense Cold Weather boots. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine.<br>- Continue validation of ski systems and all components to include boots and clothing.<br>- Continue the comparative analysis of sister services clothing items to minimize sustainment cost.<br>- Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles.<br>- Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals. | | | | | |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boots.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Load Bearing and Pack Systems (LBPS)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Initiated exploration of potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry.<br>- Initiated evaluations to implement minor product improvements to existing systems such as the USMC Pack System.<br>***FY 2017 Plans:***<br>- Continue exploration of potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness.<br>- Continue evaluations to implement minor product improvements to existing USMC systems.<br>***FY 2018 Base Plans:***<br>- Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness.<br>- Continue evaluations to implement minor product improvements to existing USMC systems.<br>***FY 2018 OCO Plans:***<br>N/A | 0.403<br>- | 0.242<br>- | 0.310<br>- | 0.000<br>- | 0.310<br>- |
| ***Title:*** Individual Warfighting Equipment (IWE)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Continued cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). Current efforts for previously included Waterproof Bags for USMC Pack are now supported by Load Bearing Pack Systems (LBPS).<br>- Continued modernization of existing projects by leveraging the technological advances of industry.<br>***FY 2017 Plans:*** | 0.000<br>- | 0.217<br>- | 0.195<br>- | 0.000<br>- | 0.195<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA).<br>- Continue modernization of existing projects by leveraging the technological advances of industry.<br>***FY 2018 Base Plans:***<br>- Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA).<br>- Continue modernization of existing projects by leveraging the technological advances of industry.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Family of Field Medical Equipment (FFME)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Continue to test COTS/NDI medical equipment items for the ERCS (En-Route Care System), FRSS (Forward Resuscitative Surgical Suite)and STP (Shock Trauma Platoon) to determine future viability in an operational environment.<br>- Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment.<br>- Continue testing for possible application technology for insertion.<br>- Continue collaborative testing with Army for patient movement research.<br>- Continue collaborative testing efforts with Army for Autonomous Critical Care System (ACCS).<br>- Initiate collaborative testing efforts with Army for Blast Load Assessment: Sense and Test (BLAST) to determine viability in a operational environment in support of reduction of Traumatic Brain Injury (TBI) effects.<br>***FY 2018 Base Plans:***<br>- Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operation environment. | 0.000<br>- | 1.386<br>- | 1.245<br>- | 0.000<br>- | 1.245<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment.<br>- Continue testing for possible application technology for insertion.<br>- Continue collaborative testing with Army for patient movement research.<br>- Continue collaborative testing efforts with Army for ACCS.<br>- Continue collaborative testing efforts with Army for BLAST to determine viability in a operational environment in support of reduction of Traumatic Brain Injury (TBI) effects.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Family of Shelters and Shelter Equipment (FSSE)<br>***Articles:***<br>***Description:*** The increase of $0.345M from FY17 to FY18 supports the continuation of testing and development of the Single Source Heater to improve energy efficiency and reduce the overall logistics burden of the USMC Soft Wall Shelters.<br>***FY 2016 Accomplishments:***<br>- Continued rigid wall composite shelter prototype development.<br>- Initiated development of energy efficient Engineer Change Proposals (ECPs) for Family of Shelters and Shelter Equipment (FSSE).<br>***FY 2017 Plans:***<br>- Continue development of energy efficient Engineer Change Proposals (ECPs) for Family of Shelters and Shelter Equipment (FSSE).<br>- Continue development of the Single Source Heater (SSH) (formerly identified as the Next Generation Heater) for soft wall shelters. Initiated in FY15.<br>- Complete rigid wall composite shelter prototype development.<br>***FY 2018 Base Plans:***<br>- Continue development of energy efficient Engineer Change Proposals (ECPS) for Family of Shelters and Shelter Equipment (FSSE). | 0.170<br>- | 0.130<br>- | 0.475<br>- | 0.000<br>- | 0.475<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue development of the Single Source Heater (SSH) (formerly identified as the Next Generation Heater) for soft wall shelters.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Family of Combat Field Feeding (CFFS)<br>***Articles:*** | 0.000<br>- | 0.104<br>- | 0.059<br>- | 0.000<br>- | 0.059<br>- |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden.<br>- Initiate testing of phase III Small Business Innovative Research (SBIR) for alternate heating sources for Combat Field Feeding heating rations.<br>***FY 2018 Base Plans:***<br>- Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden.<br>- Continue testing of phase III SBIR for alternate heating sources for Combat Field Feeding heating rations.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.775 | 3.462 | 4.656 | 0.000 | 4.656 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Cold Weather and Mountaineering, Load Bearing and Pack Systems, Individual Warfighting Equipment, Marine Corps Uniforms: Items utilize various acquisition strategies. These programs leverage heavily on current developments and technology in commercial industry. As a result, the government's R&D phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate, the Naval Research Laboratory or the U.S. Army Natick Soldier Research, Development and Engineering Center via Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing Economic Order (EO) Quantities.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2503 / *Initial Issue* |

Family of Shelters: The Shelter acquisition strategy is to modify NDI to further meet the requirements of the Marine Corps, to support development of multi-service items through inter-service agreements and to adopt COTS items.

Family of Field Medical Equipment: These programs leverage heavily on current development and technology in the commercial medical industry. The field medical acquisition strategy is to modify NDI and adopt COTS items.

Combat Field Feeding Systems: This program utilized various acquisition strategies and leverages heavily on current developments and technology in commercial industry and other Service field feeding systems. As a result, the government's RDTE phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate or the U.S. Army Natick Soldier Research, Development and Engineering Center (DoD Executive Agent for Field Feeding) via ID/IQ contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing EO Quantities.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2513 / *Body Armor* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2513: *Body Armor* | 45.501 | 2.863 | 2.746 | 4.380 | - | 4.380 | 5.015 | 4.900 | 4.823 | 4.919 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Ballistic Protection Systems (BPS) provides the most technologically advanced protection at the lightest weight possible. It provides the critical ballistic protective systems that save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more Marines in the fight. Major BPS programs include: Plate Carrier (PC); Enhanced Small Arms Protective Inserts (ESAPI); Light Weight Helmet (LWH); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); and hearing protection. Key Components of all of the BPS programs are adapting ballistic protective systems to the constantly changing threat environment and leveraging emerging technologies to lighten the load and increase the mobility of each Marine.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Ballistic Protection Systems | 2.863 | 2.746 | 4.380 | 0.000 | 4.380 |
| ***Articles:*** | - | - | - | - | - |

***Description:*** RDT&E funding increases ($1.634M) from FY17 to FY18 to develop, research, and test emerging technology and advancements in products and materials related to protective equipment.

***FY 2016 Accomplishments:***

- Continued research with industry partners towards understanding and developing the future technology associated with next generation Personal Protective Equipment (PPE) (i.e. helmets, body armor, eyewear, and hearing protection).
- Continued to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal.
- Continued testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments.
- Continued testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability.
- Completed ECH Characterization Testing.

***FY 2017 Plans:***

- Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2513 / *Body Armor* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal.<br>- Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments.<br>- Continue testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability.<br>***FY 2018 Base Plans:***<br>- Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection).<br>- Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal.<br>- Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments.<br>- Complete testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.863 | 2.746 | 4.380 | 0.000 | 4.380 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

Marine Corps Ballistic Protection Systems (BPS) research, development, testing & evaluation activities include seeking new developments in ballistic technology that feature reductions in weight, improvements in ballistic performance, enhanced operational effectiveness through improved product designs and the application of new material technologies to reduce total ownership costs by improving the expected service life of fielded systems. In order to accomplish these goals, Product Manager-Infantry Combat Equipment uses a broad array of government and contractor performers to achieve the desired end state. This includes partnerships with government entities and research and development contracts and partnership intermediaries where applicable. The Marine Corps also leverages advancements in industry capabilities to rapidly field non-developmental and commercially available off the shelf armor solutions. Performance is confirmed by characterizing ballistic performance and data collected during user evaluations.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2513 / *Body Armor* |

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>2928 / *Exp Indirect Fire Gen Supt Wpn Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2928: *Exp Indirect Fire Gen Supt Wpn Sys* | 11.464 | 1.316 | 1.054 | 2.990 | - | 2.990 | 2.632 | 2.161 | 2.207 | 2.249 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

High Mobility Artillery Rocket Systems (HIMARS) is a C-130 transportable, wheeled, indirect fire, rocket/missile system capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The system includes one launcher, two Re-Supply Systems, and the MFOM. HIMARS will provide the Marine Air-Ground Task Force (MAGTF)with 24 hour ground-based, responsive General Support/General Support Reinforcing (GS/GSR) indirect fires which accurately engage targets at long range (60+km), with high volumes of lethal fire under all weather conditions throughout all phases of combat operations ashore, to include irregular warfare and distributed operations. HIMARS is a significant improvement over previously fielded ground fire support systems. During a 24 hour period, the system is expected to conduct multiple moves and multiple fire missions. Guided Multiple Launch Rocket System (GMLRS) is the primary munition for USMC units fielded with the HIMARS. GMLRS provides medium, and long range precision and area fires to destroy and/or suppress threat forces. GMLRS integrates GPS guidance to achieve accuracy, requiring fewer rockets to defeat targets, and thus reduces the logistics burden.

HIMARS is a significant improvement over previously fielded ground fire support systems. During a 24 hour period, the system is expected to conduct multiple moves and multiple fire missions. Guided Multiple Launch Rocket System (GMLRS) is the primary munition for units fielded with the HIMARS. GMLRS provides close, medium, and long range precision and area fires to destroy, suppress, and shape threat forces and protect friendly forces against cannon, mortar, rocket and missile artillery, light material and armor, personnel, command and control, and air defense surface targets. GMLRS integrates guidance and control packages and an improved rocket motor achieving greater range and precision accuracy, requiring fewer rockets to defeat targets, thereby reducing the logistics burden. The GMLRS integrates a multi-mode fuse and high explosive warhead making it an all-weather, precision strike rocket. The three GMLRS variants are GMLRS with Dual Purpose Improved Conventional Munitions (DPICM), GMLRS Unitary (U), and GMLRS Alternative Warhead (AW). GMLRS U expands the MLRS target set into urban and complex environments by adding point, proximity, and delay fusing modes. GMLRS U have been fired in support of Overseas Contingency Operations (OCO), and has demonstrated high effectiveness and low collateral damage while supporting Marines in combat. GMLRS AW was developed to replace GMLRS-DPICM and meet the requirements outlined in a 25 June 2008 cluster munitions policy.

HIMARS satisfies the Marine Corps requirement for an indirect fire system that is responsive, maneuverable, and is capable of engaging targets at long range. The Reduced Range Practice Rocket (RRPR) includes training devices for tactical training, classroom training and handling exercises.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** HIMARS Expeditionary & Naval Integration Capabilities | 1.316 | 1.054 | 2.990 | 0.000 | 2.990 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2928 / *Exp Indirect Fire Gen Supt Wpn Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** NOTE: The increase of $1.936M from FY17 to FY18 is due to the initiation of the HIMARS At Sea capability. This capability will allow a HIMARS launcher to be fired from a ship.<br><br>***FY 2016 Accomplishments:***<br>-Continued the Marine Corps study of the capability to employ HIMARS from distributed locations and naval platforms, or surface connectors to support distributed maneuvers.<br>-Continued development of long range precision fires capabilities for HIMARS from austere and expeditionary bases.<br><br>***FY 2017 Plans:***<br>-Integrate and test new radios that meet new NSA encryption standards.<br><br>***FY 2018 Base Plans:***<br>-Complete expeditionary radio development.<br>-Initiate development of HIMARS At Sea capability,<br>-Moving Target<br>-Fire from Ship<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.316 | 1.054 | 2.990 | 0.000 | 2.990 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/BLI 221200: *High Mobility Artillery Rocket System (HIMARS)* | 16.285 | 53.015 | 59.943 | 5.360 | 65.303 | 40.184 | 48.020 | 211.446 | 380.509 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

USMC HIMARS is procuring the Army rocket launcher, the current/future Multiple Launch Rocket System Family of Munitions (MFOM) and a Medium Tactical Vehicle Replacement (MTVR) based Resupply System (truck(s) with associated trailer(s)). The Marine Corps launcher and ammo requirements closely match U.S. Army requirements. The U.S. Army HIMARS program received increased funding and is now an Acquisition Category (ACAT) IC level program. Marine Corps Resupply System requirements are unique. Accordingly, the Marine Corps is an integrator and must ensure the required warfighting capability is fielded to the Marine Corps

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>2928 / *Exp Indirect Fire Gen Supt Wpn Sys* |

operating forces. The USMC has aligned funds to reflect an emphasis on not only hardware development, but also the integration of these principle end items while providing associated evaluation and oversight, and the development of associated rocket munitions in conjunction with the Army. Additionally, the Marine Corps program is establishing the training and support methodologies that will result in associated skill sets required within the Marine Corps. The Marine Corps strategy is incorporating acquisition and capability upgrades to both the systems and rocket munitions. These improvements parallel the U.S. Army's acquisition strategy.

**E. Performance Metrics**

Milestone Reviews

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>3098 / *Fire Support System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3098: *Fire Support System* | 138.392 | 13.391 | 5.242 | 6.145 | - | 6.145 | 5.871 | 7.606 | 7.727 | 5.842 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This project develops Joint and Marine Corps unique improvements to artillery fire support technology that supports the artillery triad of fires and fire support equipment. These initiatives include but are not limited to the following: the Expeditionary Fire Support System (EFSS), munitions development & testing (to Precision Extended Range Munition), as well as testing and development of the Family of Artillery Munitions (FAM), Common Laser Ranger Finder (CLRF) integrated capability, and the Modeled Meteorological Information Manager (MMIM).

EFSS is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. The EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and Control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations. FY17 will complete qualification.

FAM funding is used to develop and mature artillery munitions for the Marine Corps triad of fire and includes conducting safety analysis and ship compatibility studies.

The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems.

The Fire Support Mod Line (FSML) is a set of Marine Corps efforts to address critical operational and logistics deficiencies in existing, fielded fire support/weapons systems and equipment. FSML provides technical refresh and development of target acquisition, artillery survey, meteorological systems, weapon systems, and fire direction control. Funding is used to ensure Clinger Cohen Act (CCA) and Information Assurance (IA) requirements are met. Provides execution of product improvements/modifications, and upgrades to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Modeled Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S) and the Improved Position Azimuth Determining System (IPADS), Lightweight Target Designator (LTD), the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD), and the Common Laser Range Finder (CLRF). Funding is also used for upgrades, engineering change proposals (ECPs), and modifications for guided munitions and fire control systems which fall within Fire Support Systems for the Marine Corps.

The Family of Internally Transportable Vehicles (FITV) are light weight and internally transportable in the V-22, CH-53D & CH53E helos. The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is then fielded to Reconnaissance, Marine Corps Forces Special Operations Command (MARSOC), and artillery batteries as part of the Expeditionary Fire Support System (EFSS). The FITV also provide Special Operations Forces (SOF) with platforms to support their primary and secondary missions. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. In FY20 the Marine Corps will establish the Internally

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

Transportable Vehicle Replacement (ITV-R) initiative. The ITV-R will replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV). Research, testing and developmental efforts will begin in FY19 for the ITV-R.

Conventional Ground Ammunition is a project that identifies and develops Insensitive Munitions (IM) Technologies to address IM shortfalls in new Marine Corps development or improvements to legacy Conventional Ground Ammunition to meet OSD mandated IM compliance requirements. These IM Technology investments directly support the development of the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP) to address the identified IM technology needs of the Marine Corps.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Modeled Meteorological Information Manager (MMIM) | 0.823 | 0.242 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems significantly enhancing the accuracy of meteorological information.<br><br>NOTE: Decrease of $0.242M from FY17 to FY18 is due to realignment of MMIM to Fire Support Mods (FSM) beginning in FY18.<br><br>***FY 2016 Accomplishments:***<br>- Initiated research and technical support efforts to enhance communication of meteorological data that will support the production of computer meteorological messages for use with Advanced Field Artillery Tactical Data System (AFATDS) to support battalion artillery operations.<br>***FY 2017 Plans:***<br>- Complete testing of MMIM forecast capability.<br>***FY 2018 Base Plans:***<br>- Shift funding and capability from Modeled Meteorological Manager (MMIM) to Fire Support Mods (FSM) for lifecycle sustainment.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Expeditionary Fire Support Systems (EFSS) | 10.271 | 2.868 | 2.293 | 0.000 | 2.293 |
| ***Articles:*** | - | - | - | - | - |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** EFSS is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations.<br><br>NOTE: The decrease of $0.566M from FY17 to FY18 is due to the completion of Precision Extended Range Munition (PERM) round development and entering fielding. FY17 will complete qualification.<br><br>***FY 2016 Accomplishments:***<br>-Initiated the development of Low Rate Initial Production (LRIP) test assets that will be destroyed during test.<br>-Initiated the development of Tabular Firing Tables, Centaur and Advanced Field Artillery Tactical Data System (AFATDS) updates and final Gunner Display Unit - Marine (GDU-M) software development, all for use in support of PERM Type Qualification Testing (TQT) and LRIP testing.<br><br>***FY 2017 Plans:***<br>-Complete PERM qualification testing.<br>-Continue tabular Firing Table development for PERM.<br><br>***FY 2018 Base Plans:***<br>- Continue development of the EFSS fire control system for PERM. Incorporating PERM upgrades and Miniature Mission Setter (MMS) software development.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Fire Support Mods (FSM) | 1.197 | 1.099 | 2.750 | 0.000 | 2.750 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Funding is used for upgrades, engineering change proposals (ECP), and modifications to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S), the Improved Position Azimuth Determining System (IPADS), and the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD) as well as technical refresh for target acquisition, and artillery survey and meteorological systems. Funding | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| is also used for upgrades, Engineering Change Proposals (ECPs) and modifications for guided munitions and fire control systems which falls within Fire Support Systems for the Marine Corps.<br><br>NOTE: Increase of $1.651M from FY17 to FY18 is due to MMIM realignment under FSML Line and increased research and development efforts associated with IPADS advanced components, developmental acoustic detection system testing, and MMIM communication reach-back efforts.<br><br>***FY 2016 Accomplishments:***<br>- Completed procurement of IPADS Control and Display Unit hardware replacement and software upgrade.<br>- Continued engineering and research efforts to determine future IPADS capability requirements to support future artillery survey.<br>- Initiated integration of AIM/FNC into fire support systems which will provide near 100% 2 mil azimuth availability to support targeting. The AIM/FNC program goal is to demonstrate a handheld, lightweight, affordable inertial navigation system (INS) capable of accurate azimuth determination in all environments, which will significantly improve the capabilities of ground-based, small unit fires.<br>- Initiated development testing of acoustic detection system with a digital communications capability to replace GCFS system.<br>***FY 2017 Plans:***<br>- Continue development of acoustic detection system to replace GCFS system.<br>- Continue product improvements to increase performance capability of legacy targeting and other fire support systems.<br>***FY 2018 Base Plans:***<br>- Continue development of acoustic detection system to replace GCFS system.<br>- Continue product improvements to increase performance capability of legacy targeting and other fire support systems.<br>- Initiate development of advanced components for the IPADS replacement system.<br>- Shift funding and capability from Modeled Meteorological Manager (MMIM) to Fire Support Mods (FSM) for lifecycle sustainment.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Family of Artillery Munitions (FAM) | 0.293 | 0.310 | 0.316 | 0.000 | 0.316 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** FAM - Efforts include acquisition planning for future munitions, replacement of existing stockpiles, and providing technologically enhanced artillery munitions in order to mitigate/fill capability gaps in range, accuracy, and lethality and reduce undue logistical burden. Additionally, the program office addresses Weapon System Explosives Safety Review Board (WSESRB) requirements for naval transportation issues for all artillery projectiles, propellants, and fuzes.<br><br>***FY 2016 Accomplishments:***<br>- Continued to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for M1122, M1123 (IR) and M1124 (VL).<br><br>***FY 2017 Plans:***<br>-Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for M1122, M1123 (IR) and M1124 (VL).<br><br>***FY 2018 Base Plans:***<br>-Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit (PGK) anti-jam development.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Family of Internally Transportable Vehicle (FITV) | 0.332 | 0.253 | 0.253 | 0.000 | 0.253 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Family of Internally Transportable Vehicle (FITV) program fields expeditionary vehicles to ground units to support various operations. Provides the Marine Air-Ground Task Force (MAGTF) ground combat units with vehicles transportable in the MV-22 and CV-22 tilt-rotor aircraft as well as the CH53. The FITV is an integral part of the Expeditionary Fire Support System (EFSS).<br><br>***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Initiated comparative analysis and modeling to support proposed modification recommendations required to increase the FITV system readiness, safety and reliability. Engineering efforts to improve the system readiness of the FITV.<br>***FY 2017 Plans:***<br>-Initiate streamlined acquisitions of Commercial-Off-the-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated and tested in a short amount of time. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).<br>***FY 2018 Base Plans:***<br>-Continue streamlined acquisitions of Commercial-Off-the-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated and tested in a short amount of time. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Conventional Ground Ammunition | 0.475 | 0.470 | 0.533 | 0.000 | 0.533 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** All DoD services are required to field munitions that are insensitive munitions (IM) compliant. IM compliancy is measured by the performance of munitions to six tests; Fast Cook-Off, Slow Cook-Off, Bullet Impact,<br>Fragment Impact, Sympathetic Detonation, and Shape Charge Jet. Services are required to submit IM Strategic Plans annually delineating how they intend on executing their Service IM effort to maximize IM improvements to both new development and legacy conventional ground ammunition. These IM Strategic Plans, Supporting Plan of Actions, and Milestones, with funding trial, are submitted to the JROC, demonstrating each Service's commitment to the continuing effort to improve IM characteristics of Conventional Ground Ammunition, for approval. In order to achieve the system's IM performance, the Conventional Ground Ammunition developer/ owner must have new technology identified and available to address IM shortfalls at the onset of the ammunition development or available for insertion during improvement opportunities for legacy ammunition. Under this | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| program, the USMC invests in IM technology which will improve its existing munitions IM reactions or ability to reliably initiate IM technologies and complies with the OSD mandate for maximum feasible IM compliance.<br><br>***FY 2016 Accomplishments:***<br>Funded Multi-point Initiation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)<br>-Evaluated reliability of different multi-point arrays in mortar systems<br>-Procured Fiber Bragg system to measure propagation of detonation in multi-point arrays<br><br>Funded Insensitive Munitions Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny, NJ)<br>-Completed IM propellant formulation development<br>-Manufactured small scale quantities of propellant<br>-Completed charge 0 ballistic testing of legacy TCA<br>***FY 2017 Plans:***<br>Continue -<br>(1) Multi-point Initiation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD)<br>-Utilize Fiber Bragg system to measure propagation of detonation and evaluate improvement in lethal effect with multi-point array<br><br>(2) IM Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny, NJ)<br>-Complete SCO tests<br>-Perform closed bomb testing of propellant<br>-Procure hardware for ballistic testing<br><br>Funded Thermally Initiated Venting System (Systima Technologies, Inc., Kirkland WA)<br>-Evaluate feasibility of TIVS technology in Mk22 rocket motor<br>***FY 2018 Base Plans:***<br>Continue - | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| (1) IM Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny NJ)<br>-Complete ballistic testing of new TCA design<br>-Integrate IM technology into weapon<br><br>(2) Thermally Initiated Venting System (Systima Technologies, Inc., Kirkland WA)<br>-Develop initial design of TIVS for Mk22 rocket motor<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.391 | 5.242 | 6.145 | 0.000 | 6.145 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/2064: *Expeditionary Fire Support Systems* | 0.000 | 3.360 | 0.626 | - | 0.626 | 0.066 | 0.070 | 0.071 | 0.071 | 0.000 | 94.326 |
| • PMC/473301: *Modeled Meterological Information Manager (MMIM)* | 0.232 | 0.488 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 8.402 |
| • PMC/473302: *Fire Support Mods* | 2.768 | 3.552 | 4.064 | 0.050 | 4.114 | 4.123 | 4.250 | 4.365 | 4.468 | 0.000 | 85.180 |
| • PMC/5230: *Motor Transport Modification* | 2.554 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/6545: *Family of ITV* | 18.638 | 9.654 | 1.583 | - | 1.583 | 0.633 | 0.669 | 6.691 | 8.713 | 0.000 | 128.981 |
| • PMC/5050: *Motor Transport Modification* | 0.000 | 4.302 | 3.993 | - | 3.993 | 3.302 | 3.370 | 3.436 | 3.505 | Continuing | Continuing |

**Remarks**

For FITV, the PMC BLI 5050 and 5230 reflect only the LTV Mod portion of the BLI, which covers all light tactical vehicles.

**D. Acquisition Strategy**

These programs range from off-the-shelf modifications to developmental items. Development will typically be conducted at government labs.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>3098 / *Fire Support System* |

Expeditionary Fire Support System (EFSS) and the Precision Extended Range Munition (PERM):
EFSS: Support current readiness levels while developing the means of streamlining the acquisition of spare parts. Continue to develop and procure digital equipment used to support Expeditionary Fire Control System (EFCS)and digitize the EFSS mortar line.
PERM: Finalize testing and procure the first option buy for PERM. Conduct testing that supports EFCS development and fielding that will be conducted in coordination with PERM first options buy.

Family of Artillery Munitions (FAM):
Program includes four (4) artillery munitions which are being developed by the Army. The Army is the lead service for these programs but continues to interact with the FAM IPT to ensure USMC requirements and capability needs are met. This allows the USMC to become users of the munition and certify the round for naval transportation. The munitions include but are not limited to; XM1156 Precision Guidance Kit (PGK), M1122 and M1123 Infrared (IR) and M1124 Visual Light (VL) 155mm RAP Round. Each munitions' status is tracked to ensure Marine Corps requirements are satisfied throughout the systems lifecycle.

Fire Support Mods:
Develop an improved Acoustic Sensor capability by exploiting recent technology improvements in computation and networking to improve data fusion. An early prototype is anticipated in FY19. The improved acoustic sensor will be capable of transmitting digital information via JVMF to AFATDS in support of artillery and counter fire operations. Initiate coordination between the Army's Armament, Research and Development Engineering Center (ARDEC), and MCSC's and NSWC DD science and technology efforts to commence development of the Future Survey System. Continue liaison with the Army's PM TAS in order to leverage future efforts and increase the probability of a joint procurement. Initiate development of a MMIM communications reach back capability to allow for ingestion of meteorological data into artillery firing data for units deployed to austere locations with limited or no bandwidth communications. Procure hardware and software refreshes for the GPSS, MASS and MMIM to ensure compliance with cybersecurity policies, address obsolescence and interoperability with other C2 systems.

Family of Internally Transportable Vehicles (FITV):
The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components. This effort includes the Internally Transportable Vehicle Replacement (ITV-R) initiative which will begin to replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

Conventional Ground Ammunition:
The Conventional Ground Ammunition strategy is to invest in Insensitive Munitions (IM) technologies to address IM shortfalls of priority programs identified in the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP). Once the IM technologies have been successfully demonstrated and matured, the intent is to insert the new technologies into new conventional ground ammunition development as well as provide opportunities to improve legacy munitions IM characteristics. The IM R&D effort directly addresses the mandated OSD requirement to obtain incremental IM improvement in pursuit of becoming fully IM compliant to the maximum extent practicable.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | Project (Number/Name)<br>4002 / *Family of Raid Reconnaissance* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4002: *Family of Raid Reconnaissance* | 3.764 | 0.514 | 0.449 | 0.548 | - | 0.548 | 0.547 | 0.536 | 0.550 | 0.561 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Project supports multiple airborne/parachuting and specialized reconnaissance related programs focusing on immediate capability enhancements for numerous insertion and personnel equipment shortfalls currently within Marine Reconnaissance and Marine Raider units. These enhancements will improve airborne capability, equipment and items for direct action missions, and specialized raid equipment.

Name change from PB17 to PB18: Underwater Reconnaissance Capability (URC) to Amphibious Reconnaissance Capability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Airborne Reconnaissance Equipment (ARE) | 0.450 | 0.347 | 0.433 | 0.000 | 0.433 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as Automatic Activation Device, Enhanced Multi Mission Parachute System and system safety verification.<br>- Initiated research and development on personnel parachute and aerial delivery fielded programs, to parachute performance testing. | | | | | |
| ***FY 2017 Plans:***<br>- Continue technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as Automatic Activation Device, Enhanced Multi Mission Parachute System, and system safety verification.<br>- Continue research and development on personnel parachute and aerial delivery fielded programs, such as parachute performance testing. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue technology upgrades and evaluation of emerging reliability challenges presented by fielded systems, such as the Enhanced Multi Mission Parachute System and system safety verification.<br>- Continue research and development on personnel parachute and aerial delivery fielded programs, such as parachute performance testing. | | | | | |
| ***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>4002 / *Family of Raid Reconnaissance* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Amphibious Reconnaissance Capability | 0.064 | 0.102 | 0.115 | 0.000 | 0.115 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Completed the test and evaluation of the Diver Propulsion Device (DPD) upgrades to support the propulsion solution to the Diver Reconnaissance Vehicle (DRV) to fulfill Amphibious Reconnaissance Capability.<br>- Continued the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology. | | | | | |
| ***FY 2017 Plans:***<br>- Initiate research and development efforts on improved amphibious support equipment to fulfill Amphibious Reconnaissance Capability, to include battery development and testing.<br>- Continue the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue research and development efforts on improved amphibious support equipment to fulfill Amphibious Reconnaissance Capability, to include battery development and testing.<br>- Continue the test and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.514 | 0.449 | 0.548 | 0.000 | 0.548 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/6518: *Amphibious Support Equipment* | 3.882 | 7.371 | 5.830 | - | 5.830 | 4.732 | 4.838 | 4.943 | 5.043 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

(U) Airborne Reconnaissance Equipment (ARE) acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose equipment for aerial delivery and parachuting, such as the Parachutist's High Altitude Oxygen System (PHAOS); Automatic Activation Device (AAD); and the Tandem Offset Resupply Delivery System (TORDS)/Military Tandem Tethered Bundle (MTTB) System.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206623M / *MC Ground Cmbt Spt Arms Sys* | **Project (Number/Name)**<br>4002 / *Family of Raid Reconnaissance* |

(U) Amphibious Reconnaissance Capability acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose and lifesaving equipment for Marine Corps Diving and Small Craft, such as the Marine Assault Breacher's Kit (MABK), Marine Individual Assault Kit (MIAK), Diver Propulsion Device (DPD), and Combat Rubber Raiding Craft (CRRC).

**E. Performance Metrics**

Milestone reviews.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0206624M *I Marine Corps Cmbt Services Supt* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 227.933 | 23.423 | 13.194 | 25.258 | - | 25.258 | 26.561 | 37.818 | 14.106 | 14.384 | Continuing | Continuing |
| 0201: *Logistical Veh Sys Replacement (LVSR)* | 36.878 | 0.565 | 0.264 | 0.236 | - | 0.236 | 0.211 | 0.213 | 0.218 | 0.222 | Continuing | Continuing |
| 2316: *Combat Service Support Eng Equip* | 72.605 | 8.861 | 4.984 | 18.298 | - | 18.298 | 18.310 | 31.556 | 7.711 | 7.864 | Continuing | Continuing |
| 2509: *Motor Transport Mod* | 43.577 | 1.227 | 1.578 | 1.213 | - | 1.213 | 1.222 | 1.251 | 1.279 | 1.304 | Continuing | Continuing |
| 2510: *MAGTF CSSE & SE* | 20.787 | 8.414 | 5.090 | 3.877 | - | 3.877 | 4.906 | 4.027 | 4.112 | 4.193 | Continuing | Continuing |
| 2929: *Testing Measuring Diag Equip & SE* | 8.851 | 0.785 | 0.538 | 0.577 | - | 0.577 | 0.617 | 0.632 | 0.645 | 0.657 | Continuing | Continuing |
| 9C90: *MTVR Mod* | 45.235 | 3.571 | 0.740 | 1.057 | - | 1.057 | 1.295 | 0.139 | 0.141 | 0.144 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvement. It will enhance combat breaching capabilities of the ground combat elements, logistics, maintenance and transportation. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the light fleet of vehicles. This includes projects such as: Alternative Power Sources for Communications Equipment (APSCE) which is a suite of devices that provide the commander with the capability to use existing power to operate his communication equipment, computers and peripheral equipment instead of using batteries or fossil fuel generators; the Marine Corps Family of Automatic Test Systems (ATS), formerly TETS, which provides automatic testing capability for use by technicians both in garrison and forward edge of the battlefield; improvements in all areas of the M1A1 main battle tank, LVSR & MTVR; the High Performance Capabilities for Military Vehicles Project which is dedicated to applying the best practices of the motor sports industry to military vehicles including engineering expertise, equipment and technology.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0206624M *I Marine Corps Cmbt Services Supt* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 19.955 | 13.194 | 15.118 | - | 15.118 |
| Current President's Budget | 23.423 | 13.194 | 25.258 | - | 25.258 |
| Total Adjustments | 3.468 | 0.000 | 10.140 | - | 10.140 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 3.904 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.435 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 10.000 | - | 10.000 |
| • Rate/Misc Adjustments | -0.001 | 0.000 | 0.140 | - | 0.140 |

**Change Summary Explanation**

The $12.064M increase from FY17 to FY18 can be attributed to M1A1 Modifications for the Active Protection System (APS) Technology Demonstrator design in order to make the system operationally suitable for the Marine Corps.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>0201 / *Logistical Veh Sys Replacement (LVSR)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0201: *Logistical Veh Sys Replacement (LVSR)* | 36.878 | 0.565 | 0.264 | 0.236 | - | 0.236 | 0.211 | 0.213 | 0.218 | 0.222 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Logistics Vehicle System Replacement (LVSR) is the USMC Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. The Medium/Heavy Modification line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that effect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life cycle management, and it allows the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 0.435 | 0.132 | 0.236 | 0.000 | 0.236 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Completed Safety & Engineering Change Proposal (ECP) development required to meet the diverse environments of current and future operations of Marine Air Ground Task Force (MAGTF) Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach.<br>- Began development of a solution to emergent brake corrosion issue and cab floor board for PMCS issue | | | | | |
| ***FY 2017 Plans:***<br>- Continue to support safety modification development and ECP development required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach.<br>- Continue development of brake corrosion solution. | | | | | |
| ***FY 2018 Base Plans:***<br>- Continue to support safety modification development and ECP development required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach.<br>- Complete development and provide solution to LVSR Brake ECP issues to LVSR fleet. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>0201 / *Logistical Veh Sys Replacement (LVSR)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate development of armored door latch for vehicles to replace faulty latches (door closing mechanism), which are liable to break under impact.<br>- Initiate development of Engineering Egress Lighting Solution.<br>- Initiate root cause analysis for the armored cab bracket failure.<br>***FY 2018 OCO Plans:***<br>- N/A | | | | | |
| ***Title:*** Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Continued engineering change proposal and safety support required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare. Incorporating new safety upgrades that will protect the warfighter and LVSR vehicle from possible catastrophic events as warranted by continual changes in threat environment.<br>***FY 2017 Plans:***<br>- Complete engineering change proposal and safety support required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach.<br>***FY 2018 Base Plans:***<br>- N/A<br>***FY 2018 OCO Plans:***<br>- N/A | 0.130<br>- | 0.132<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| **Accomplishments/Planned Programs Subtotals** | 0.565 | 0.264 | 0.236 | 0.000 | 0.236 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/5230: *Motor Transport Modifications* | 8.326 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/5050: *Logistics Vehicle System Replacement* | 2.296 | 1.768 | 11.280 | - | 11.280 | 2.020 | 2.092 | 2.141 | 2.191 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>0201 / *Logistical Veh Sys Replacement (LVSR)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

Motor Transport Modifications transferred from BLI 5230 to 5050 starting in FY17.
PMC LVSR portion of PMC BLI 5050 is associated with LVSR C0201

**D. Acquisition Strategy**

The Logistics Vehicle System Replacement (LVSR) program used a two-phase, single-step acquisition approach rather than an evolutionary acquisition approach. Phase I developed the Cargo variant and Phase II developed the Tractor and Wrecker variants. The program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) to maintain relevancy on the battlefield and implement system requirements.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2316 / *Combat Service Support Eng Equip* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2316: *Combat Service Support Eng Equip* | 72.605 | 8.861 | 4.984 | 18.298 | - | 18.298 | 18.310 | 31.556 | 7.711 | 7.864 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

M1A1 Mod Kit: The M1A1 Mod Kit effort includes improvements in all areas of the M1A1 main battle tank and the Armored Vehicle Launched Bridge (AVLB). The M1A1 tank provides armor-protected mobile firepower to the Marine Air Ground Task Force (MAGTF). Efforts under the mod line pertaining to the M1A1 include improvements such as: lethality systems, to increase armament accuracy and provide for off-board targeting improvement; survivability systems (including passive and active); communications and command and control; mobility; increasing the crew's situational awareness through sensor enhancements and intra-vehicular data sharing; and environmental testing of components. The AVLB provides the Marine Corps only armor-protected assault gap crossing capability. Continued funding is required to address obsolescence and address operational deficiencies to adapt the tank and AVLB to a changing operational environment and support user-defined product improvements. Funding also supports items such as miscellaneous tools and test items for the M1A1 tank and associated supporting platforms, safety and sustainment modifications to the bridge launcher, and Materiel Fielding Support.

The Engineer Mods and Tool Kits line funds modifications and initiatives which are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies and other issues that affect vehicle reliability, availability and readiness. This approach ensures proper vehicle sustainment and life cycle management in response to evolving needs of the Marine Corps fleet. Operational needs to provide personnel survivability on engineer equipment is essential to current and future operations. Research and development funding develops and integrates new lighter, compact armor technology and supports ballistic testing for applications to existing and future acquisitions.

Corrosion Prevention and Control (CPAC): The useful life of Marine Corps assets will be extended through a comprehensive CPAC RDT&E program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition. The CPAC RDT&E Program works to standardize and substantially improve strategies, objectives and processes to prevent, detect, and treat corrosion and its effects on Marine Corps ground vehicles and weapons systems. This mission responds to the Congressional directives and DoD and SECNAV instruction to reduce the negative operational effects and associated total ownership cost of Marine Corps ground vehicles and weapons systems.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support urgent operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines, and small arms fire threats. Multiple vehicle categories (CATs) have been procured, fielded, and sustained: MRAP All Terrain Vehicle (M-ATV) - Combat Operations (ops) in rural, mountainous, urban terrain. Category I - Urban combat operations, ambulance. Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle. Category III - Mine/ IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and development funding develops and integrates support efforts such as ballistic glass or other safety issues, new armor technology and ballistic testing.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Engineer Mods and Tool Kits | 0.436 | 0.479 | 0.616 | 0.000 | 0.616 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued to support work for Matting applications in support of the Engineer Family of Systems.<br>-Completed project management design and integration efforts supporting Route Reconnaissance and Clearance (R2C) Capability Set Integration Kits.<br>***FY 2017 Plans:***<br>-Initiate new Engineer Change Proposals in support of Improved Ribbon Bridge development to fix corrosion pin issues.<br>***FY 2018 Base Plans:***<br>-Initiate testing of the Engineer Change Proposals in support of the Improved Ribbon Bridge.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** M1A1 Modifications | 5.329 | 1.319 | 14.228 | 0.000 | 14.228 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed the research and development effort for AIDATS and initiated other development efforts such as the Firepower Enhancement Program (FEP).<br>-Initiated development efforts for the Active Protection System (APS) Technology Demonstrator to experiment and test the M1A1 with APS in order to capture Marine-unique operational, employment and platform specific challenges and requirements as well as MAGTF integration opportunities and challenges. This informed requirements, enabled lessons learned for future acquisition programs, and increased the Marine Corps' knowledge on APS.<br>***FY 2017 Plans:***<br>-Initiated obsolescence mitigation and upgrade development for the Firepower Enhancement Program (FEP) and upgrade the advanced Gunnery Primary Sight Lower Panel with the most current capabilities.<br>- Program received $4.0M of additional funding in FY16 for APS, which accounts for the subsequent $4.0M decrease in FY17. Continue development efforts for the Active Protection System (APS) Technology Demonstrator. Efforts include design and mounting of an Installation Kit on the M1A1 to install the APS, | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| installation of the APS, Limited User Evaluation, physical characteristics assessments, stabilization, target tracking, and main gun fire testing, and live fire shots.<br>***FY 2018 Base Plans:***<br>-Continue supporting enhancements to FEP and initiate research and development of components for the Ammunition Data Link (ADL) Increment II in order to support the ability to utilize next generation munitions to their full capability across the M1A1 fleet. Support upgrades to the Advanced Gunnery Training System (AGTS), specifically incorporation of the AIDATS, Tank Commander's Single Handle (TCSH), and Slew to Cue (STC). Funding increase from FY17 to FY18 ($2.909M) supports the completion of prior development projects.<br>- Funding increase in FY18 of $10.000M to conduct Non-Recurring Engineering (NRE) on the APS Technology Demonstrator design in order to make the system operationally suitable for the Marine Corps. The USMC will refine the Active Protection System (APS) Technology Demonstrator's design with extensive Non-Recurring Engineering in FY18 and FY19 to make it more operational for the USMC. Changes includes relocating components to improve crew visibility, relocation of radar to allow reinstallation and use of smoke grenades, redesigned sponson boxes to lower launcher profile and maintain required Basic Item Issue storage, redesign armor for crew backblast protection and uninhibited operation of Stabilized Commander's Weapon Station (SCWS) .50-cal Machine Gun, relocation of internal turret controls and displays for better Human Factors and crew employment, and investigation of cyber issues.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Mine Resistant Ambush Protected Family of Vehicles | 0.826 | 0.589 | 0.547 | 0.000 | 0.547 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued research and development of Engineering Change Proposals (ECPs) and conducted armor ballistic testing in support of survivability and mobility upgrades.<br>***FY 2017 Plans:***<br>-Continue research and development of Engineering Change Proposals (ECPs) and armor ballistic testing in support of survivability and mobility upgrades.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass or other safety issues and new armor ballistic testing in support of survivability and mobility upgrades.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Corrosion Prevention and Control (CPAC) | 2.270 | 2.597 | 2.907 | 0.000 | 2.907 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Materials project where evaluations are ongoing on vendor product submission to determine suitability prior to use on USMC Ground equipment.<br>***FY 2017 Plans:***<br>-Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps and product qualification for chip and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability.<br>***FY 2018 Base Plans:***<br>-Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps and product qualification for chip | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 8.861 | 4.984 | 18.298 | 0.000 | 18.298 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/6670: *Items Less than $5M - CPAC & Eng Mods & Tool Kits* | 5.146 | 4.342 | 4.408 | - | 4.408 | 4.646 | 4.742 | 4.833 | 4.930 | Continuing | Continuing |
| • PMC/2061: *M1A1 Modification Kit* | 11.412 | 12.577 | 14.883 | - | 14.883 | 15.246 | 15.390 | 35.699 | 43.176 | Continuing | Continuing |
| • PMC/6520: *EOD Systems - MRAP* | 0.508 | 0.346 | 1.152 | - | 1.152 | 1.216 | 1.243 | 1.269 | 1.293 | Continuing | Continuing |
| • PMC/7000: *M1A1 Modification Kit* | 2.069 | 4.380 | 0.362 | - | 0.362 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 6.811 |

**Remarks**

M1A1 Modification Kit: APS development efforts in FY16-20 enable the planned procurement of APS systems and supporting counter-measures in FY21-22.

**D. Acquisition Strategy**

(U) The M1A1 modification kits program will leverage Army initiatives to the maximum extent and incorporate modifications to adapt Army solutions to the USMC environment. The USMC will research, develop, and evaluate programs to improve the survivability and lethality of the USMC tank. These efforts include the Abrams Integrated Display and Targeting System (AIDATS), threat detection and warning, situational awareness, survivability, and ownership cost reduction work. The USMC will refine the Active Protection System (APS) technology demonstrator's design, pursuing a Milestone B decision with follow on Non-Recurrent Engineering in FY18 and FY19 in preparation for live fire testing and evaluation conducted along with the Army in FY20. Procurement of APS systems and supporting counter-measures is planned in FY21 and FY22.

(U) Engineer Mods and Tool Kits: This is a roll-up line of various engineering efforts, modifications and other related items less than $5 Million each. This program provides for significant improvements to various pieces of engineering equipment by enhancing their capabilities and improving readiness.

(U) Corrosion Prevention and Control (CPAC) Program: The Program will execute the RDT&E Program to the Naval Surface Warfare Center - Carderock Division Corrosion Research and Engineering Branch and the Naval Research Laboratory for a comprehensive program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

(U) Mine Resistant Ambush Protected (MRAP): The Program will execute RDT&E funds to research, develop, and evaluate survivability and mobility upgrades efforts such as the Cougar Egress Upgrades, Ballistic Glass or Other Safety Issues, New Armor Technology and Ballistic Testing. Work will be accomplished through centers of excellence, such as Naval Surface Warfare, Panama City, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2316 / *Combat Service Support Eng Equip* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineer Mod Kit | TBD | MCSC : TBD | 0.000 | 0.000 | | 0.479 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.479 | - |
| MRAP Modifications | WR | VARIOUS : VARIOUS | 0.802 | 0.329 | Apr 2016 | 0.188 | Dec 2016 | 0.188 | Dec 2017 | - | | 0.188 | Continuing | Continuing | Continuing |
| M1A1 Modifications - APS | MIPR | TACOM : Warren, MI | 0.000 | 4.289 | Jun 2016 | 0.069 | Apr 2017 | 8.043 | Dec 2017 | - | | 8.043 | Continuing | Continuing | Continuing |
| M1A1 Modifications - FEP STS | SS/CPFF | Raytheon : McKinney, TX | 0.000 | 0.000 | | 0.325 | Aug 2017 | 0.400 | Feb 2018 | - | | 0.400 | Continuing | Continuing | Continuing |
| M1A1 Modifications - FEP Symbology | MIPR | DMEA : Sacramento, CA | 0.000 | 0.563 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.563 | - |
| M1A1 Modifications - Laser Upgrade | MIPR | ARDEC : Picatinny, NJ | 0.000 | 0.000 | | 0.000 | | 0.384 | Jan 2018 | - | | 0.384 | Continuing | Continuing | Continuing |
| M1A1 Modifications - Communication Mod. | MIPR | SSC LANT : Charleston, NC | 0.000 | 0.000 | | 0.000 | | 0.200 | Feb 2018 | - | | 0.200 | Continuing | Continuing | Continuing |
| M1A1 Modifications - TWMP | MIPR | BENET Labs : Albany, NY | 0.000 | 0.000 | | 0.000 | | 0.200 | Nov 2017 | - | | 0.200 | Continuing | Continuing | Continuing |
| M1A1 Modifications - APS / IMOD | MIPR | TACOM : Warren, MI | 0.000 | 0.000 | | 0.925 | Apr 2017 | 1.214 | Jan 2018 | - | | 1.214 | 0.000 | 2.139 | - |
| M1A1 Modifications - APS | C/CPFF | Raytheon : McKinney, TX | 0.000 | 0.000 | | 0.000 | | 0.743 | Mar 2018 | - | | 0.743 | 0.000 | 0.743 | - |
| M1A1 Modifications - GPS LP | MIPR | MCSC : Quantico, VA | 2.556 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| MRAP Engineering | WR | NSWC : Panama City, FL | 2.212 | 0.000 | | 0.126 | Dec 2016 | 0.129 | Dec 2017 | - | | 0.129 | Continuing | Continuing | Continuing |
| M1A1 Modifications - AGTS | MIPR | PM TRASYS : Orlando, FL | 3.177 | 0.000 | | 0.000 | | 1.444 | May 2018 | - | | 1.444 | Continuing | Continuing | Continuing |
| M1A1 Modifications - AIDATS EMD | MIPR | ABERDEEN PROVING GROUND : Aberdeen, MD | 2.988 | 0.477 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.465 | - |
| M1A1 Modifications - ADL II | MIPR | Picatinny Arsenal : Picatinny, NJ | 1.174 | 0.000 | | 0.000 | | 1.600 | Jan 2018 | - | | 1.600 | Continuing | Continuing | Continuing |
| Prior Year Cumulative. Funding | Various | VARIOUS : VARIOUS | 41.469 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 41.469 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 54.378 | 5.658 | | 2.112 | | 14.545 | | - | | 14.545 | - | - | - |

**Remarks**

M1A1 Modifications - APS / IMOD: Payments pursuant to adding the United States Marine Corps as a principal organization involved in the Trophy Active Protection System Accelerated Characterization (TAAC) Project Agreement (PA) with the Israel Ministry Of Defense (IMOD).

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CPAC | C/BA | TACOM : Warren, MI | 0.000 | 0.525 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.525 | - |
| Prior Year Cumulative Funding | Various | Various : various | 0.300 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.300 | - |
| CPAC | C/FFP | NSWC-CD : Bethseda, MD | 1.303 | 0.145 | Dec 2015 | 1.025 | Dec 2016 | 1.019 | Dec 2017 | - | | 1.019 | 0.000 | 3.492 | - |
| | | **Subtotal** | 1.603 | 0.670 | | 1.025 | | 1.019 | | - | | 1.019 | 0.000 | 4.317 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MRAP FoV Ballistic Evaluations | MIPR | ATC : Aberdeen, MD | 2.749 | 0.497 | Jun 2016 | 0.275 | Dec 2016 | 0.230 | Dec 2017 | - | | 0.230 | Continuing | Continuing | Continuing |
| Prior Year Cumulative Funding | Various | Various : Various | 1.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.500 | - |
| Engineer Modifcation Kits | Various | Various : Various | 0.000 | 0.000 | | 0.000 | | 0.616 | Feb 2018 | - | | 0.616 | 0.000 | 0.616 | - |
| Engineer Modification Kits | MIPR | Aberdeen Proving Grounds : Aberdeen MD | 1.866 | 0.436 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| CPAC | WR | NSWC-CD : Bethseda, MD | 9.622 | 1.215 | Dec 2015 | 1.072 | Dec 2016 | 1.388 | Dec 2017 | - | | 1.388 | 0.000 | 13.297 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2316 / *Combat Service Support Eng Equip* | |

**Test and Evaluation ($ in Millions)**

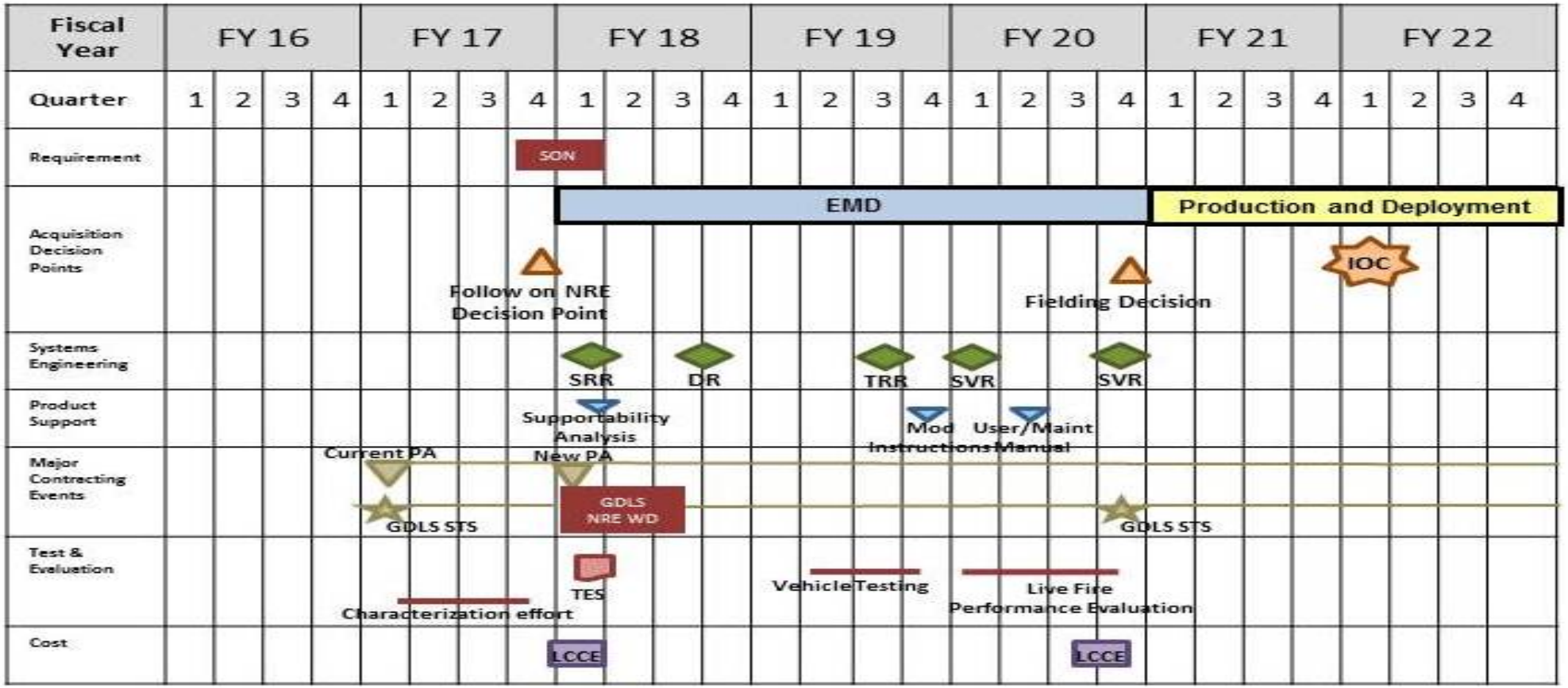
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CPAC | WR | NRL : Arlington, VA | 0.887 | 0.385 | Dec 2015 | 0.500 | Dec 2016 | 0.500 | Dec 2017 | - | | 0.500 | 0.000 | 2.272 | - |
| | | **Subtotal** | 16.624 | 2.533 | | 1.847 | | 2.734 | | - | | 2.734 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 72.605 | 8.861 | | 4.984 | | 18.298 | | - | | 18.298 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

# Expedited APS Funding & Schedule



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2316 / *Combat Service Support Eng Equip* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2316*** | | | | |
| Expedited APS Schedule: MDD | 1 | 2018 | 1 | 2018 |
| Expedited APS Schedule: EMD | 1 | 2018 | 4 | 2020 |
| Expedited APS Schedule: Production and Deployment | 1 | 2021 | 4 | 2022 |
| Expedited APS Schedule: MS C | 4 | 2020 | 4 | 2020 |
| Expedited APS Schedule: IOC | 1 | 2022 | 1 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2509 / *Motor Transport Mod* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2509: *Motor Transport Mod* | 43.577 | 1.227 | 1.578 | 1.213 | - | 1.213 | 1.222 | 1.251 | 1.279 | 1.304 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Marine Corps Tactical Motor Transport Modification (MTM) project manages procurement and life cycle sustainment for more than 25,000 light fleet vehicle and tactical trailer principle end items. A sustained effort is maintained in the Marine Corps for development and testing in support of fleet Service Life Extension Program (SLEP) initiatives, vehicle quality deficiency resolutions, safety initiatives, environmental/state transportation mandated vehicle changes, and system component refresh modifications efforts to include addressing deficiencies of HMMWV vehicles due to up armoring and age degradation of the fleet. Since transportation asset operational availability declines at a steady rate over time, SLEP, fleet overhauls, and enhanced depot level modifications are essential in maintaining a viable transportation capability in the Marine Corps Operating Forces.

The M88A2 Modification program funds research, development and testing of improvements in all areas of the M88A2 HERCULES vehicle, which provides the MAGTF heavy combat recovery capability. Funding addresses obsolescence and Engineering Change Proposals (ECPs) to improve performance and develop safety related ECPs to correct hazards noted during the standard day to day operation of the M88A2 Improved Recovery Vehicle.

The HMMWV Sustainment Modification Initiative (SMI) program was cancelled effective FY 2016. FY 2015 funding supported engineering studies and analysis to evaluate the vehicle performance, safety and reliability. This program does not have funding beyond the FY15 HMMWV project. Future Legacy HMMWV safety and reliability efforts will be funded as a part of the Motor Transport Modification project 2509.

P-19 Replacement (P-19R) is replacing the obsolete A/S32P-19A Crash Fire Rescue fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle is outfitted with advanced fire suppression equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structural fires in support of base camps and as firefighting support to other elements of the Marine Air Ground Task Force (MAGTF), such as ammunition supply points, Petroleum, Oil, and Lubricant (POL) distribution points, or hazardous material storage facilities.

The Family of Trailers & Ancillary Equipment program will explore options for "lightening the Marine Air Ground Task Force (MAGTF)" weight and cube attributes of the light and medium/heavy trailer fleet. Seeking technologies and other current and emerging options that can be employed to achieve optimum lift capability while constrained to the desired weight and cube. Transportation and expeditionary goals will be considered in the research and development phase for the trailer fleet. Will develop long-term modernization plans for the medium and heavy trailers within the Marine Corps to address operating safety enhancements, mission maintainability enhancements, and crew ergonomic improvements.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2509 / *Motor Transport Mod* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** M88A2 HERCULES | 0.290 | 0.333 | 0.352 | 0.000 | 0.352 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The FY 2017 to FY 2018 overall program funding decrease of $0.365M is a result of fewer system modifications developed and system modification tests conducted by both the P-19 Replacement and the Motor Transport Modification (MTM).<br><br>***FY 2016 Accomplishments:***<br>-Initiated the development of modifications for the M88A2 and supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements.<br><br>***FY 2017 Plans:***<br>-Continue the development of modifications for the M88A2 and supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements.<br><br>***FY 2018 Base Plans:***<br>-FY 2017 to FY 2018 funding increase of $0.019M will support the development of Artic Mobility solution set in response to Marine Forces Europe (MARFOREUR) Universal Needs Statement (UNS) addressing M88A2 ability to support Tanks in artic conditions.<br>-Continue the development of modifications for the M88A2 and supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** P-19 Replacement | 0.093 | 0.326 | 0.067 | 0.000 | 0.067 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Completed testing of the P-19R in support of FRP.<br>- Initiated development of system modifications that include:<br>(1) Auxiliary Power Unit (APU) phase I and test 10KW (kilowatt) for Engineering Change Proposals (ECP's); | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2509 / *Motor Transport Mod* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| (2) APU and Heating Ventilation Air Conditioning (HVAC) phase II for ECP's.<br>***FY 2017 Plans:***<br>- Complete development, test, and integrate system modifications to improve vehicle performance and correct deficiencies identified on P-19 Replacement in support of FRP. System modifications included:<br>(1) APU phase I and test 10kW for ECP's;<br>(2) APU and HVAC phase II for ECP's.<br>- Complete development of system modifications to the 10 kW APU which will allow the vehicle crew to operate the HVAC independent of the primary engine; this resulted in fuel consumption savings and reduced maintenance on the primary engine.<br>***FY 2018 Base Plans:***<br>- The decrease of $259K from FY17 to FY18 is due to the completion of some prior year development and testing activities.<br>- Initiate the development and test activities such as reliability and snow and ice testing to satisfy mobility requirement for Marine Corps Prepositioning Program-Norway (MCPP-N).<br>- Initiate the development of consistent Snow and Ice tire chain solution for the vehicles.<br>- Initiate tests and evaluations of the Snow and Ice tire chains to be deployed to vehicle fleet.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Motor Transport Modification (MTM) | 0.103 | 0.724 | 0.594 | 0.000 | 0.594 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed efforts to evaluate, test, and integrate system modifications to improve vehicle performance and correct deficiencies identified for application on Motor Transportation light, medium, and heavy tactical assets.<br>***FY 2017 Plans:***<br>Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2509 / *Motor Transport Mod* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Family of Trailers & Ancillary Equipment<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Continued testing to ensure effectiveness of Light Tactical Trailers (LTT) with the High Mobility Multipurpose Wheeled Vehicle (HMMWV) fleet and also for the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), enabling the fleet to maintain mobility requirements.<br>***FY 2017 Plans:***<br>Continue testing to ensure effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), enabling the fleet to maintain mobility requirements. Durability analysis is focus of FY17 efforts. The FY16 to FY17 decrease ($0.614M) is due to completion of testing to address MTVR Trailer safety and performance needs.<br>***FY 2018 Base Plans:***<br>Continue testing to ensure effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), enabling the fleet to maintain mobility requirements. The FY17 to FY18 increase ($0.005M) is due to Trailer Performance Test/Durability Analysis (rust/corrosion) continuing efforts.<br>***FY 2018 OCO Plans:***<br>N/A | 0.741<br>- | 0.195<br>- | 0.200<br>- | 0.000<br>- | 0.200<br>- |
| **Accomplishments/Planned Programs Subtotals** | 1.227 | 1.578 | 1.213 | 0.000 | 1.213 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/5230: *Motor T Mod* | 2.554 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 104.119 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2509 / *Motor Transport Mod* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/5097: *Family of Tactical Trailers* | 3.757 | 2.691 | 1.938 | - | 1.938 | 3.166 | 3.237 | 3.301 | 3.369 | Continuing | Continuing |
| • PMC/2061-01: *M88A2 HERCULES Mod* | 2.725 | 2.673 | 2.895 | - | 2.895 | 2.951 | 3.011 | 3.070 | 3.131 | Continuing | Continuing |
| • PMC/4630-01: *M88A2 HERCULES Mod* | 0.163 | 0.164 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| • PMC/5006-02: *P-19* | 16.366 | 87.141 | 32.141 | - | 32.141 | 0.334 | 0.364 | 0.369 | 0.380 | Continuing | Continuing |
| • PMC/5050: *Motor T Mod* | 9.292 | 13.292 | 21.824 | - | 21.824 | 13.554 | 13.867 | 14.145 | 14.435 | Continuing | Continuing |

**Remarks**

Funding for Motor Transport Modifications moves from BLI 5230 to BLI 5050 beginning in FY 2017. FY16 value for 5230 above is only for funding associated with light and medium tactical vehicles as well as trailers.

**D. Acquisition Strategy**

The M88A2 HERCULES program leverages Army developmental projects to create a system that more readily meets Marine Corps Heavy Recovery Vehicle requirements. Improvements include modifications addressing safety, reliability, and technology upgrades.

The HMMWV Sustainment Modification Initiative (SMI) program was cancelled effective FY 2016. FY 2015 funding supported engineering studies and analysis to evaluate the vehicle performance, safety and reliability. Efforts will be focused on developing improvements to vehicle performance, safety and reliability.

The P-19 Replacement leverages COTS and NDI components in an effort to minimize costs, test requirements, and reduce development time. P-19R will supplant the aging A/S32P-19A fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle will be outfitted with advanced fire suppression equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structure fires in support of base camps and as firefighting support to other elements of the MAGTF, such as ammunition supply points, Petroleum, Oil, and Lubricants (POL) distribution points, or hazardous material storage facilities. A Firm Fixed Price (FFP) contract was awarded in May 2013 with step-ladder pricing for procurement of large quantities. The contract structure provides for production, testing, and training. A delivery order can be placed in any year for production quantities up to 200 vehicles.

Motor Transport Modification (MTM) funding will focus on streamlined acquisitions of Commercial-Off-The-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated, and tested in a short amount of time. MTM funding will be used for modifications required to increase MTM fleet readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, SLEPs, or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2509 / *Motor Transport Mod* |

The Family of Trailers & Ancillary Equipment (FTT) management strategy will use RDT&E funding to explore current and new technological options that can be used to achieve optimum lift within the desired weight and cube constraints in support of the "Lightening the MAGTF" initiative, as well as sustaining and/or improving capabilities. Transportation and expeditionary goals will be considered in the research and development for the light and medium/heavy trailer fleet to include (but not limited to) the M1076 PLS (Palletized Load System) Trailer, MK1077 Flatrack, MTVR Trailer, M870 Ton Low Bed, Mk970 Tactical Refueler and the Flatrack Refueler Capability (FRC).

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | Date: May 2017 |
|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2510 / *MAGTF CSSE & SE* | | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2510: *MAGTF CSSE & SE* | 20.787 | 8.414 | 5.090 | 3.877 | - | 3.877 | 4.906 | 4.027 | 4.112 | 4.193 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are a part of Expeditionary Energy Initiatives.

**A. Mission Description and Budget Item Justification**

Environmental Control Equipment:
The Family of Environmental Control Equipment consists of Environmental Control Units, Field Refrigeration Systems, Integrated Trailer ECU and Generator Systems, and Cooling and Refrigeration Expeditionary Tool Kits. These systems provide required heating, cooling, storage, and servicing for systems throughout the Marine Corps. Current efforts seek to replace all legacy ECUs with systems of higher reliability and higher efficiency using EPA-approved refrigerants, more energy efficient enhanced mobility, easier to repair, and quieter than their predecessors. With environmental control systems consuming 50-70% of tactical electric power in theater, this savings will be a significant contribution to reducing the USMC fuel demand, and lightening the Marine Air-Ground Task Force (MAGTF). The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum-derived fuels, increased local energy security, and reduced tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.
Efforts such as research, development, integration testing of
(1) Field Refrigeration Systems (FRS) Refrigerant Unit (RU) replacement. This effort seeks to replace legacy RUs in current USMC Large and Small FRSs complying with EPA regulations while increasing efficiency thus reducing overall power requirements/demands.
(2) The Enhanced Environmental Control Unit (E2CU) program is the second generation of a family of environmental control units from 9,000 BTU to 60,000 BTU/Hr cooling output. The E2CU program will provide tactical Heating, Ventilation and Air Conditioning (HVAC) and superior reliability for all MAGTF units in all operational concepts. E2CU will have significant average fuel efficiency improvements over the current ECU family has been demonstrated while complying with newer EPA regulations on refrigerants.

Mobile Power Equipment:
The Family of Mobile Electric Power Equipment consists of command and control systems for power management and distribution (intelligent power management), tactical generators ranging from 2 to 200 kilowatts, power distribution systems, energy storage systems, load banks, floodlights, cabling, and electrician tool kits.
This equipment is to procure, field, manage and provide electricity on the battlefield. Systems may be mounted on prime movers, skids or trailers. Systems support maneuver, combat support, and combat service support units requiring tactical power to operate weapons systems, Command, Control, Communications, Computers and Intelligence (C4I) systems, medical and messing facilities, environmental control equipment, and water purification systems. With over 10,000 generators and using diesel engines in the Operating Forces, improving their fuel efficiency and reliability will be a significant contribution to reducing the USMC fuel demand, and lightening the MAGTF. The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum derived fuels, increased local energy security, and reduced

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.

Efforts encompass research, development, integration, and testing of the following items:
(1) Intelligent Power Management Systems (IPMS) which support a robust, scalable solution to interconnect, control, store and distribute power from various sources. As a result, the power requirements will be met in a more efficient manner thus reducing fuel consumption. The IPMS will use multiple electrical inputs from military generators, vehicles and renewable sources. Subsystems include Digital Control System (DCS), Energy Storage Unit (ESU), and Intelligent Power Distribution System (IPD).
(2) Large Advanced Power Sources (LAMPS) procurement of newer more fuel efficient large format generators (100-200kw) replacing the legacy generators and ensuring commonality with the Army large format generators.

Advanced Power Sources:
The Advanced Power Sources (APS) efforts will focus on achieving the Marine Corps goal of lightening the Marine Air Ground Task Force (MAGTF) through reduced logistical fuel resupply needs. The Mobile Electric Hybrid Power Source (MEHPS) Capability Development Document (CDD) addresses the USMC Expeditionary Water and Waste (E2W2) Initial Capabilities Document (ICD) and supports the MAGTF intent to: travel lighter and faster, use less fuel, depend less on the supply chain; and reduce energy production, storage, and distribution requirements. This CDD addresses the Operational Energy (OE) ICD identifying the power and energy criticalities to the Joint Force. The Mobile Electric Hybrid Power System (MEHPS) will focus on hybrid power systems capable of improved fuel efficiency and silent operations in the 0.5-5kW and 10-15kW power range. These systems will be smaller, lighter and more efficient systems that reduce the demand for fossil fuels, extending the Commander's operational reach. These efforts will transition into production of systems that integrate with the Tactical Quiet Generator (TQG), Advanced Medium Mobile Power Sources (AMMPS), and future generator sets. The Battery Maintenance and Storage Shelter effort will focus on developing a modular solution to store and maintain a variety of battery form factors and chemistries. This will provide an environmentally protected, deployable battery maintenance and storage shelter with the capability to maintain and condition deployable batteries that will significantly decrease O&M costs to the Fleet by extending the life of fielded batteries.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Environmental Control Equipment | 0.192 | 0.262 | 0.507 | 0.000 | 0.507 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The FY17 to FY18 funding increased by $0.245M to continue product development of future E2CU systems. | | | | | |
| ***FY 2016 Accomplishments:***<br>-Initiated design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate and complete evaluation and testing of USMC Field Refrigeration Units (FRU) replacements.<br>***FY 2018 Base Plans:***<br>-Continue design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Mobile Power Equip/Hybrid Generator/Next Gen Power Distribution System<br>***Articles:***<br>***Description:*** The FY17 to FY18 funding decreased by $0.567M due to completion of product development for Micro-Grid Storage/Intelligent Power Management (IPM) effort.<br>***FY 2016 Accomplishments:***<br>-Initiated product development of commercial Micro-Grid Storage/Intelligent Power Management (IPM)effort.<br>***FY 2017 Plans:***<br>-Complete product development of commercial Micro-Grid Storage/Intelligent Power management (IPM) effort.<br>-Initiate testing and integration of commercial Micro-Grid Storage/Intelligent Power Management (IPM)effort into subsystems.<br>***FY 2018 Base Plans:***<br>-Continue testing and evaluation for the Micro-Grid Storage/Intelligent Power Management (IPM) effort.<br>***FY 2018 OCO Plans:***<br>N/A | 2.830<br>- | 1.841<br>- | 1.274<br>- | 0.000<br>- | 1.274<br>- |
| ***Title:*** Advanced Power Sources<br>***Articles:***<br>***Description:*** The FY17 to FY18 funding decreased by $0.891M due to the completion of Mobile Electric Hybrid Power Sources (MEHPS) testing.<br>***FY 2016 Accomplishments:***<br>MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS) | 5.392<br>16 | 2.987<br>6 | 2.096<br>- | 0.000<br>- | 2.096<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Completed award of two (2) RDT&E contracts for Engineering, Manufacturing and Development (EMD) of the Mobile Electric Hybrid Power Sources (MEHPS). Each contractor produced 8 test articles for a total of 16 test articles. Results of the developmental testing used to refine the performance specification in support of the production and deployment phase.<br>***FY 2017 Plans:***<br>MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS)<br>-Initiate Mobile Electric Hybrid Power Sources (MEHPS) developmental testing and Battery Storage and Maintenance Shelter EMD contract award.<br>***FY 2018 Base Plans:***<br>MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS)<br>-Conduct Mobile Electric Hybrid Power Sources (MEHPS) Field User Evaluation (FUE) to define system requirements and assess military utility, usability, human factors and system capabilities.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 8.414 | 5.090 | 3.877 | 0.000 | 3.877 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/6054: *Environmental Control Equipment* | 0.000 | 0.018 | 1.405 | - | 1.405 | 4.534 | 3.385 | 3.453 | 3.521 | Continuing | Continuing |
| • PMC/6366-1: *Mobile Power Equipment* | 0.738 | 3.493 | 6.694 | - | 6.694 | 9.744 | 6.094 | 6.213 | 6.340 | Continuing | Continuing |
| • PMC/6366-2: *Advanced Power Sources* | 8.217 | 14.480 | 3.216 | - | 3.216 | 15.311 | 15.617 | 15.925 | 16.244 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

MCPC: 268198 Environmental Control Units: Initial focus on development of more efficient 36,000 BTU/Hr and 60,000 BTU/Hr size model Environmental Control Units (ECUs), since they make up the greatest percentage of the inventory and are used extensively for shelter heating and cooling. Full and open competition. Three contractors to develop and deliver prototypes in two size models. Government testing to validate performance. Single contractor to produce both models using multi-

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2510 / *MAGTF CSSE & SE* |

year ID/IQ production contract. Low Rate Initial Production (LRIP), followed by LRIP testing, then Full Rate Production (FRP) to procure using PMC funds on annual Delivery Orders. ECUs are organically supported by Marines.

MCPC: 268298/Mobile Power Sources: Focus on development of Micro-Grid Storage/Intelligent Power Management (IPM). Acquisition Strategy is for Full and Open competition. Government testing to validate performance on prototypes followed by Full Rate Production (FRP) to procure on multiple Delivery Orders.

MCPC: 110402/Advanced Power Sources: The acquisition strategy is to focus on development of the Mobile Electric Hybrid Power System (MEHPS). This R&D effort will focus on achieving the Marine Corps goal of lightening the MAGTF through reduced logistical fuel resupply needs, extending the Commander's operational reach. The development will focus on making these systems smaller, lighter and more efficient. The MEHPS program will purchase 8 medium and 8 light systems from two vendors through competitively awarded EMD contracts. The MEHPS systems will undergo rigorous electrical, environmental, safety, and performance testing to ensure they are robust and meet user requirements. Information learned in the EMD phase will help define the performance specification that will be used to award a full and open production contract. The Battery Maintenance and Storage Shelter will purchase 3 systems from 2 vendors through competitively awarded EMD contracts. Both systems will undergo rigorous electrical, environmental, safety, and performance testing to ensure the systems are robust and meet user requirements. Information learned in the EMD phase will help define the performance specifications that will be used to award full and open production contracts.

**E. Performance Metrics**

E2CU: Energy efficiency; size; weight; EPA-approved refrigerant; affordability; organically supportable.
MOBILE POWER: Energy efficiency; size; weight; affordability; organically supportable.
MEHPS: 55% savings in fuel and 80% reduction in generator runtime versus a standard 10 Kilowatt (kW) Tactical Quiet Generator (TQG).
BMASS: Energy efficiency; size; weight; ability to charge specified batteries.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>2929 / *Testing Measuring Diag Equip & SE* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2929: *Testing Measuring Diag Equip & SE* | 8.851 | 0.785 | 0.538 | 0.577 | - | 0.577 | 0.617 | 0.632 | 0.645 | 0.657 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Marine Corps Family of Automatic Test Systems (ATS), formerly called Third Echelon Test Sets (TETS), provides automatic test program capability for use by technicians both in garrison and the forward edge of the battlefield; specifically in the areas of interactive electronic technical manuals, condition/predictive based maintenance, and embedded sensors and prognostics.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Automatic Test Systems (ATS) | 0.785 | 0.538 | 0.577 | 0.000 | 0.577 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Completed advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems. | | | | | |
| ***FY 2017 Plans:***<br>-Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems. | | | | | |
| ***FY 2018 Base Plans:***<br>-Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.785 | 0.538 | 0.577 | 0.000 | 0.577 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4181: *Automatic Test Systems (ATS)* | 7.310 | 8.782 | 16.463 | 8.241 | 24.704 | 8.493 | 13.195 | 5.101 | 5.204 | Continuing | Continuing |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>2929 / *Testing Measuring Diag Equip & SE* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

**D. Acquisition Strategy**

Automatic Test Systems (ATS) acquisition is being done through U.S. Army Armament Research, Development & Engineering Center (ARDEC), Picatinny contracts; In-house at Marine Corps Logistics Command (MCLC), Albany, GA; In-house at Naval Surface Warfare Center, Crane, IN and Commercial Technologies for Maintenance Activities (CTMA) at OSD, Washington D.C.

**E. Performance Metrics**

N/A

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | Date: May 2017 |
|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | Project (Number/Name)<br>9C90 / *MTVR Mod* | | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9C90: *MTVR Mod* | 45.235 | 3.571 | 0.740 | 1.057 | - | 1.057 | 1.295 | 0.139 | 0.141 | 0.144 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Medium Transport Vehicle Replacement Modification program line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management, and it allows the program office the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 1.969 | 0.423 | 0.100 | 0.000 | 0.100 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** NOTE: The overall increase ($0.317M) from FY17 to FY18 is due to additional Fuel Efficiency (FE) performance testing required in FY18. | | | | | |
| ***FY 2016 Accomplishments:***<br>- Initiated product development in support of the Office of Naval Research (ONR) Future Naval Capability (FNC) initiative for fuel economy components on different variants of the MTVR vehicles in preparation of its transition to the program office in late FY 2016, which included the detailed design of individual components and subsystems.<br>- Continued technical reviews on equipment developed.<br>- Continued the development of various ECPs due to continual changes in the threat environment which requires on-going vehicle modifications. | | | | | |
| ***FY 2017 Plans:***<br>- Continue detailed design and integration of fuel efficiency initiatives for the MTVR, building on transition from ONR in late FY 2016.<br>- Continued development of ECPs required to respond to changes in threat environment and on-going vehicle modifications. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>9C90 / *MTVR Mod* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue developing ECPs required to respond to changes in the threat environment and for on-going vehicle modifications.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support | 1.097 | 0.121 | 0.197 | 0.000 | 0.197 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued activities supporting the MTVR vehicle such as ECPs, safety, & survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations of Expeditionary Force 21.<br>- Continued acquisition planning and logistics analyses associated with fuel efficiency improvements to the MTVR.<br>- Initiated supporting energy initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment.<br>***FY 2017 Plans:***<br>- Continue to support the energy initiatives, aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment.<br>- Continue activities supporting the MTVR vehicle such as ECPs, safety, & survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations.<br>***FY 2018 Base Plans:***<br>- Continue to support the initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment.<br>- Continue the myriad activities supporting the MTVR vehicle such as ECPs, safety, & survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation | 0.505 | 0.196 | 0.760 | 0.000 | 0.760 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>9C90 / *MTVR Mod* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>- Completed design verification and design qualification testing of the array of various components and subsystems developed to achieve fuel efficiency improvements on the MTVR.<br>- Initiated Fuel Efficiency (FE) Baseline Test & Evaluation efforts supporting FE ECP of the MTVR. Also restarted Energy Initiative Test & Evaluation efforts, which support the CMC's priority for reducing energy costs, logistics footprint, and an improved environment.<br>***FY 2017 Plans:***<br>- Continue baseline FE design qualification testing, including a series of Developmental Tests of the various components and subsystems that have been designed to achieve greater fuel efficiency on the MTVR.<br>***FY 2018 Base Plans:***<br>- Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle.<br>- Complete the baseline design qualification testing and conduct field user evaluations of components and subsystems that achieve fuel efficiency improvements on the MTVR; evaluations will help determine which components and subsystems have produced the optimal fuel efficiency, using the least amount of fuel with the greatest return on investment potential.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.571 | 0.740 | 1.057 | 0.000 | 1.057 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/5050: *MTVR Motor Transport Mods* | 6.996 | 7.222 | 6.551 | - | 6.551 | 8.232 | 8.405 | 8.568 | 8.739 | Continuing | Continuing |

**Remarks**

PMC BLI 5050 Motor Transport Modifications funds multiple programs/projects; only the funding associated with MTVR C9C90 has been provided as Other APPN/LI 5050.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206624M / *Marine Corps Cmbt Services Supt* | **Project (Number/Name)**<br>9C90 / *MTVR Mod* |

**D. Acquisition Strategy**

The strategy for the MTVR Modification initiative is to aid in the prevention of parts obsolescence, address safety concerns, and respond to emergent threats. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office the flexibility to develop and implement improvements as required to respond to evolving needs.

The strategy for the MTVR Fuel Efficiency (FE) initiative is to continue development activities, as program transitioned in September 2016 from the Office of Naval Research, through the various Warfare Centers. Developmental testing will be conducted to verify FE technology data captured by ONR through the FNC effort. Limited User Evaluation testing via Governmental/Commercial facilities will be conducted on production representative items.

**E. Performance Metrics**

N/A

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0206625M *I USMC Intelligence/Electronics Warfare Sys* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 70.795 | 13.373 | 24.187 | 30.886 | - | 30.886 | 33.131 | 29.504 | 32.250 | 26.445 | Continuing | Continuing |
| 2272: *Intel Command and Control (C2) Sys* | 70.795 | 13.373 | 24.187 | 30.886 | - | 30.886 | 33.131 | 29.504 | 32.250 | 26.445 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This Program Element (PE) for Intelligence Command and Control (C2) includes Military Intelligence Program (MIP) funds for Marine Corps Intelligence capabilities necessary to support the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems collect and convert raw intelligence data on the battlefield into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis and dissemination.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 12.671 | 17.171 | 19.548 | - | 19.548 |
| Current President's Budget | 13.373 | 24.187 | 30.886 | - | 30.886 |
| Total Adjustments | 0.702 | 7.016 | 11.338 | - | 11.338 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.702 | 0.000 | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 7.016 | 10.973 | - | 10.973 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.365 | - | 0.365 |

**Change Summary Explanation**

Increase $11.3M in FY18 aligns funding profiles to the acquisition phase for the following programs: Communication Emitter Sensing and Attacking System (CESAS), Counter Intel Human Intel Equip (CIHEP). Ground Based Operational Surveillance System (GBOSS), MAGTF Secondary Imagery Dissemination System (MSIDS), Tactical Signal Intelligence (SIGINT) Collection System (TSCS), Intelligence Analysis System (IAS), Intelligence Broadcast Receiver (IBR), SCI Communications (SCI COMMS) and Tactical Exploitation of National Capabilities (TENCAP).

Increase $6.7M between FY17 and FY18 provides funding for the following major Intelligence Command and Control efforts: CESAS development of hardware/ software capability enhancements including Silk Thread; GBOSS sensor network development and testing; MSIDS data controller test and evaluation; TRSS test and evaluation of Signature Data Recorder, Hand Held Programmable Monitor and Common Sensor Radio; IAS integration, testing and evaluation of Distributed

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0206625M *I USMC Intelligence/Electronics Warfare Sys* |

Common Ground/Surface System (DCGS) Integrated Backbone into the IAS Family of Systems; IBR system integration and server producer capability; and TENCAP Rapid Reliable Targeting (RRT) capability and transition support.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | Project (Number/Name)<br>2272 / *Intel Command and Control (C2) Sys* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2272: *Intel Command and Control (C2) Sys* | 70.795 | 13.373 | 24.187 | 30.886 | - | 30.886 | 33.131 | 29.504 | 32.250 | 26.445 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Intelligence Command and Control (C2) includes Military Intelligence Program (MIP) funds for Marine Corps Intelligence capabilities necessary to support the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence through all phases of operation. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems below collect and convert raw intelligence data on the battlefield into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis and dissemination.

PERSISTENT INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (PISR) Ground Collection Systems: PISR is a comprehensive strategy that synchronizes organic and external ISR assets in support of MAGTF operations. This capability involves sensing the operational environment through a variety of systems, from satellites overhead to reconnaissance Marines on the ground. PISR incorporates terrestrial sensing capability from the following ground collection systems:

Communication Emitter Sensing and Attacking System (CESAS) is the sole USMC high power, man-packable, and ground mobile Electronic Attack (EA) asset. CESAS supports the Marine Air-Ground Task Force (MAGTF) commander in the execution of his EW operations and Information Operations, by detecting, denying, and disrupting hostile communication emitters across a broad range of communication frequencies. CESAS covers the High Frequency (HF), Very High Frequency (VHF), and Ultra High Frequency (UHF) frequency ranges against enemy emitters using modern modulation schemes. CESAS allows flexible employment to conduct EA while on the move or in a stationary position, thus optimizing the Commander's ability to employ this asset for the greatest success of the mission.

Counter Intelligence and Human Intelligence (CI/HUMINT) Equipment Program (CIHEP) provides each Marine Counterintelligence/Human Intelligence (CI/HUMINT) Company within the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE) with an integrated, standardized, and interoperable suite of information and communication systems. The CIHEP program encompasses this specialized equipment that is lightweight, modular, and tailorable, in deployable packages to conduct full spectrum, tactical CI and HUMINT activities, to include Technical Surveillance Countermeasures (TSCM) operations. TSCM operations use techniques to detect, neutralize, and exploit technical surveillance technologies and hazards that permit the unauthorized access to or removal of information. CI/HUMINT elements are generally task-organized in support of a Marine Air-Ground Task Force or other supported commanders, providing them the capability to rapidly collect, process, and disseminate counterintelligence and human intelligence information in support of military planning and operations. CIHEP is comprised of ten modules of commercial and government off the-shelf equipment. Different components are selected for refresh each year in order to maintain current capabilities and ensure interoperability and standardization with related systems. This results in an equipment suite that enhances the operating force's CI/HUMINT capabilities, while maintaining interoperability within the USMC and joint CI/HUMINT communities. The modularity of the CIHEP program allows Marines to perform a variety of missions in support of commanders, while carrying only those items necessary to accomplish the mission. CIHEP provides state- of-the-art mission critical information protection capabilities, as well as the ability to detect, identify, and locate specific technical threats.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

Ground-Based Operational Surveillance System (G-BOSS) is an expeditionary, ground-based, self-contained, multi-spectral sensor-oriented, persistent surveillance system used to observe, collect, detect, identify, classify, track, and report on contacts, objects of interest, and assessed threats twenty-four hours a day utilizing a fused video and sensor data display. System variants will allow mobility, transportability, scalability and modularity, and will be capable of independent employment or as part of a network. All G-BOSS variants may be integrated into mutually supporting, closed networks. The G-BOSS variants are: G-BOSS Light (GBL): A tripod-mounted variant that provides short-range surveillance support. It is employed when surveillance support is required, but location and operational requirements are impractical to employ either of the two other variants. G-BOSS Medium (GBM): A trailer-mounted variant that provides longer range surveillance and is transported using a light trailer and tactical vehicle while in support of mobile combat operations, convoy security, temporary security operations, etc. G-BOSS Heavy (GBH): The 80-foot tall tower configuration, Heavy variant provides surveillance support of a more permanent nature. It is employed when operations are static, displacements are few, and longer surveillance ranges are desired.

MAGTF Secondary Imagery Dissemination System (MSIDS) Family of Systems (FoS) provides organic tactical digital imagery collection, transmission and receiving capability to the MAGTF Commander. MSIDS is comprised of components necessary to enable Marines to capture, manipulate, annotate, transmit and receive images in Near Real Time (NRT), internally with subordinate commands that are widely separated throughout the areas of operation and externally with higher and adjacent commands. MSIDS capability resides with the MAGTF G/S-2 sections and Ground Reconnaissance Battalions, Light Armored Reconnaissance Battalions, Infantry Battalion Scout Sniper Platoons and Marine Corps Forces Special Operations Command. The MSIDS FoS extends the digital imaging capability to all echelons within the Marine Expeditionary Force (MEF), down to and including battalions and squadrons. Captured images are capable of being forwarded throughout the MAGTF through the use of Base Station Workstation/Communication Interface (BW/CI), Out Station Workstation/Communication Interface (OW/CI) or existing C4ISR architecture. Images can also be transmitted to the Tactical Exploitation Group (TEG) for more detailed processing and analysis. The Video Exploitation Workstation (VEW) is used to import, manipulate, annotate still and video imager, create intelligence products, lift still frames from video, view multi-format TV signals and provide a field briefing capability.

Tactical Remote Sensor Systems (TRSS) provides all weather direction, location determination, targeting, and tactical indications and warning of enemy activity in the Marine Air-Ground Task Force (MAGTF) Commander's Area of Interest. TRSS is an equipment suite consisting of three primary sub-systems: Unattended Ground Sensors (UGS); Relay Systems; and monitoring systems. The sensor systems include seismic/acoustic sensors, electro-magnetic sensors, and infrared (passive) sensors. The relay systems include SATCOM retransmission systems. The monitoring system includes the Sensor Monitoring imaging sensors group and Hand-Held Programmable Monitors (HHPM). The composition of the three sub-systems are comprised of several individual components. Upgrading individual components will occur on an as needed basis. TRSS 6.0 development improves the TRSS sensor management software in order to integrate TRSS sensor systems with theater-provided-equipment sensor systems and improve system interoperability.

Tactical Signal Intelligence (SIGINT) Collection System (TSCS) provides modular, lightweight and team/man transportable/portable systems and components which provide signal intercept, collection, Direction-Finding (DF), reporting and collection management capability to MAGTF Commander. It provides the MAGTF Commander with a modular and scalable carry on/carry off suite of equipment which exploits information from more technically advanced target sets. TSCS uses rapid technology insertion processes and procedures to incorporate advanced SIGINT technology to allow the MAGTF Commander to maintain technological parity with the adversary. The increase of $2.829M from FY17 to FY18 reflects increased development, testing, and evaluation of advanced SIGINT cyber technology.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

PROCESSING, EXPLOITATION, ANALYSIS AND PRODUCTION: Processing, exploitation, analysis and production actions of the Intelligence process enables us to understand the all-source information/data revealed by PISR.

Intelligence Analysis System, Family of Systems (IAS FoS) provides timely planning and all source fusion, analysis, and dissemination of intelligence across the Intelligence Community of the Marine Air-Ground Task Force (MAGTF). IAS FoS is a scalable system that supports all missions, and provides a tactical intelligence capability tailored to meet specific mission requirements. Advanced analytics provides improved linking of structured and unstructured data sources, data and information discovery, and improved interoperability of data and exchange amongst the existing toolset applications. Funding allows the IAS FoS to stay up-to-date with current technology (COTS/GOTS) that allows an increase in response time of intelligence analysis process, better quality intelligence products, and timely dissemination for units in all deployed environments.

Technical Control Analysis Center (TCAC) Family of Systems (FoS) consists of the AN/UYQ-83 TCAC Remote Analysis Workstation (RAWS), AN/MYQ-9 TCAC Transportable Workstation, and Cross Domain Solution (CDS), and is the focal point of Radio Battalions (RADBN), Marine Corps Forces Special Operations Command (MARFORSOC), and Fixed Wing Marine Electronic Attack Squadron (VMAQ) Signals Intelligence (SIGINT) operations. TCAC automatically collects, stores, retrieves and plays back digital audio signals, and fuses and analyzes SIGINT data from tactical, theater and national collectors and databases for dissemination to tactical commanders. TCAC provides SIGINT analysis applications to deployable Marine Air-Ground Task Force (MAGTF) units capable of directing and managing the technical and operational functions of other RADBN SIGINT/Electronic Warfare (EW) assets. TCAC provides termination of national, theater and tactical data networks for data exchange with tactical SIGINT/EW assets, the Intelligence Analysis System (IAS) and national databases. TCAC also enables the transfer of USMC tactical SIGINT collection and analytical data into the Real-Time Regional Gateway (RT-RG) and into the Distributed Common Ground System - Marine Corps (DCGS-MC). The system provides ground processing of Electronic Warfare (EW) information, including Electronic Warfare Support (EWS) and Electronic Attack (EA) data collected by the RADBN and WMAQ-EA-6B aircraft. The system is capable of correlating, fusing, and evaluating radar emitter identification and location data from the EA-6B with other National and theater sources.

INTELLIGENCE DISSEMINATION AND UTILIZATION (IDU): The IDU capability set performs the dissemination and integration functions of the Intelligence process. Dissemination connects the Intelligence product to the Commander who "operationalizes" these products through informed decisions.

The Intelligence Broadcast Receiver (IBR) acquisition program is a family of terminals that conform to the Department of Defense (DoD) Integrated Broadcast Service (IBS) objectives of interoperability and commonality to receive and process near-real time multi-intelligence data. The IBR family of terminals provide Marine Air-Ground Task Force (MAGTF) Commanders with the only direct access to IBS data via Ultra High Frequency (UHF) Satellite Communications (SATCOM) broadcast channels. The IBR program is an evolving, multi-Service architecture designed to keep pace with Commanders' targeting and information requirements and conforms to the Department of Defense Integrated Broadcast Service (IBS) objectives of interoperability and commonality, which is currently accomplished using the Universal Serial Bus (USB) Embedded National Tactical Receiver (ENTR). The ENTR Version 4 (V4) will supplement and replace the USB ENTR which is no longer in production. The ENTR V4 provides a 50% weight reduction and doubles the life expectancy of the battery compared to the USB ENTR. The IBR family of terminals receive Blue Force Tracker data, which is a key element in developing and maintaining situational awareness as it relates to the common threat/common operating picture. The IBR provides NRT strategic, theater, and tactical sensor-to-shooter connectivity as well as NRT Theater Missile Defense indications and warnings. Additionally, the IBR provides connectivity to IBS Common Interactive Broadcast and IBS Alternative Path.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

Intelligence Equipment Readiness (IER) project provides a responsive capability to alleviate Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE) systems shortfalls as a result of rapidly evolving missions and threats associated with overseas contingency operations (OCO) and expeditionary military, humanitarian assistance, and disaster relief operations. IER's primary effort is the horizontal integration of Marine Corps intelligence systems to achieve interoperability and integration into the Distributed Common Ground/Surface System-MC (DCGS-MC) framework.

Sensitive Compartmented Information Communications (SCI COMMS) - is a Super-High Frequency (SHF) multi-band satellite communications terminal, available in a transit case configuration that provides dedicated tactical communications capability at the Top Secret/Sensitive Compartmented Information (TS/SCI) and Secret Collateral levels to USMC intelligence units. TROJAN SPIRIT terminals provide connectivity into Joint Worldwide Intelligence Communications System (JWICS), National Security Agency Network (NSANET) and Secret Internet Protocol Router Network (SIPRNET) via the TROJAN Network Control Center. Funding supports research, development and testing of incremental product improvements, product interoperability and accreditation for Top Secret/Sensitive Compartmented Information (TS/SCI) connectivity.

Tactical Exploitation of National Capabilities (TENCAP) exploits current national reconnaissance systems and programs by examining both technical and operational capabilities, implementing training, and sponsoring concept demonstrations to directly support Marine Corps operating forces. The goal is to pursue technologies which exploit data from national systems to enhance intelligence support to the Marine Air-Ground Task Force (MAGTF) and/or the supported Joint Task Force commander.

Joint Worldwide Intelligence Communications System (JWICS) is the Top Secret Sensitive Compartmented Information (TS/SCI) portion of the Defense Information System Network. It incorporates advanced networking technologies that permit point-to-point or multi-point information exchange involving voice, text, graphics, data and video teleconferencing within the Department of Defense (DoD) Intelligence Community. JWICS provides Marine Forces with special intelligence that significantly enhances the detail and quality of intelligence support that intelligence organizations provide to operating forces.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** *Communication Emitter Sensing and Attacking System (CESAS): Product Development | 0.475 | 0.484 | 3.294 | 0.000 | 3.294 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Communication Emitter Sensing and Attacking System (CESAS): Increase of $2.818M from FY17 to FY18 will initiate planning to transition Silk Thread advanced digital payload/electronic warfare technology and provide program support for required hardware/software modifications to CESAS II/Radio Reconnaissance Equipment Man Packable Electronic Attack System (RREMPEAS) and hardware modifications to HMMWV PIK to enhance capability via Engineering Change Proposals (ECPs). | | | | | |
| ***FY 2016 Accomplishments:***<br>- Initiated development of required modifications for CESAS II. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate development of Light Armored Vehicle Electronic Warfare (LAV-EW) Platform Integration Kit (PIK) and Engineering Change Proposals (ECPs).<br>***FY 2018 Base Plans:***<br>-Initiate planning to transition Silk Thread advanced digital payload/electronic warfare technology. Provide required hardware/software modifications to CESAS II/RREMPEAS and hardware modifications to HMMWV PIK to enhance capability via ECPs. Initiate hardware/software capability enhancements including Silk Thread.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Communication Emitter Sensing and Attacking System (CESAS): Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>Continued to provided program support for required modifications to CESAS II.<br>***FY 2017 Plans:***<br>Continue to provide program support for required modifications to LAV-EW PIK.<br>***FY 2018 Base Plans:***<br>Continue to provide program support for required modifications to CESAS II/RREMPEAS/HMMWV PIK.<br>***FY 2018 OCO Plans:***<br>N/A | 0.030<br>- | 0.017<br>- | 0.025<br>- | 0.000<br>- | 0.025<br>- |
| ***Title:*** *Counterintel and Human Intel Equip (CIHEP): Test and Evaluation<br>***Articles:***<br>***Description:*** Counterintel and Human Intel Equip (CIHEP): Decrease of $0.367M from FY17 to FY18 reflects completion of sensor software consolidation effort.<br>***FY 2016 Accomplishments:***<br>- Continued to provided engineering, integration and technical support required for CIHEP hardware and software refresh.<br>- Initiated and provided interoperability between refreshed CIHEP Family of Systems components, to include Data Processing Module, Advanced Imagery Module, and Technical Surveillance Module.<br>***FY 2017 Plans:*** | 0.490<br>- | 0.692<br>- | 0.325<br>- | 0.000<br>- | 0.325<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue interoperability efforts between CIHEP Family of Systems components and other Intelligence systems in compatable technology baseline to reduce future costs.<br>- Continue to provide engineering, integration and technical support required for Commercial SATCOM Set upgrades and CIHEP and TRSS sensor software consolidation.<br>***FY 2018 Base Plans:***<br>- Continue to provide engineering, integration and technical support required for planned CIHEP modernization of the TSCM (Tactical Surveillance Counter Measures) equipment and CIHEP Family of Systems (FOS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Intelligence Analysis System (IAS): Product Development | 1.765 | 2.981 | 4.862 | 0.000 | 4.862 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Intelligence Analysis System (IAS): Increase of $2.576M from FY17 to FY18 supports the implementation of Distributed Common Ground/Surface System Integrated Backbone capability within the IAS Family of Systems (FoS), in order to ingest and publish Marine Corps Intelligence products directly to the greater Intelligence Community.<br>***FY 2016 Accomplishments:***<br>- Initiated integration, system testing, and evaluation of advanced analytic technologies into the Intelligence Analysis System (IAS) Family of Systems (FoS).<br>- Initiated market research, evaluation and development of advanced analytics for transition into the IAS FoS.<br>- Initiated integration, system testing, and evaluation of Windows 10 Operating System, software enhancements and new<br>Intelligence Workstation hardware into the IAS FoS.<br>***FY 2017 Plans:***<br>- Continue integration, system testing, and evaluation of advanced analytic technologies into the Intelligence Analysis<br>System (IAS) Family of Systems (FoS).<br>- Continue integration, system testing, and evaluation of Windows 10 Operating System, software enhancements, capability enhancement (such as the Universal Serial Bus Embedded National Tactical Receiver) and new Intelligence Workstation hardware into the IAS FoS. | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate integration, system testing, and evaluation of the Global Command & Control System - Joint (GCCS-J) 6.0 into the IAS FoS.<br>***FY 2018 Base Plans:***<br>- Continue integration, system testing, and evaluation of advanced analytic technologies into the Intelligence Analysis<br>System (IAS) Family of Systems (FoS).<br>- Initiate integration, system testing, and evaluation of Intelligence Servers into the IAS FoS.<br>- Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Intelligence Analysis System (IAS): Test and Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Continue support for integration and testing of advanced analytic tools into the IAS FoS software baseline.<br>- Continue support for integration and testing of Windows 10 Operating System, software enhancements and new Intelligence Workstation hardware into the IAS FoS.<br>- Initiate support for integration and testing of GCS-J 6.0 in the IAS FoS.<br>***FY 2018 Base Plans:***<br>- Continue support for integration of advanced analytics tools into the IAS FoS software baseline.<br>- Initiate support for integration and testing of Intelligence Servers into the IAS FoS.<br>- Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.299<br>- | 0.961<br>- | 0.000<br>- | 0.961<br>- |
| ***Title:*** *Intelligence Analysis System (IAS): Support<br>***Articles:***<br>***FY 2016 Accomplishments:*** | 0.569<br>- | 0.933<br>- | 0.966<br>- | 0.000<br>- | 0.966<br>- |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued program management support for integration of advanced analytics tools into the IAS FoS software baseline.<br>- Initiated program management support for integration and testing of Windows 10 Operating System, software enhancements and new Intelligence Workstation hardware into the IAS FoS.<br>***FY 2017 Plans:***<br>- Continue program management support for integration of advanced analytic tools into the IAS FoS software baseline.<br>- Continue program management support for integration and testing of Windows 10 Operating System, software enhancements and new Intelligence Workstation hardware into the IAS FoS.<br>- Initiate program management support for integration and testing of GCCS-J 6.0 in the IAS FoS.<br>***FY 2018 Base Plans:***<br>- Continue program management support for integration of advanced analytics tools into the IAS FoS software baseline.<br>- Initiate program management support for integration and testing of Intelligence Servers into the IAS FoS.<br>- Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Intelligence Broadcast Receiver (IBR): Product Development<br>***Articles:*** | 0.100<br>- | 0.111<br>- | 0.474<br>- | 0.000<br>- | 0.474<br>- |
| ***Description:*** Intelligence Broadcast Receiver (IBR): Increase $363K from FY17 to FY18 supports Networking-On-The-Move (NOTM) integration and IBS server producer capability.<br>***FY 2016 Accomplishments:***<br>- Continued required interoperability software testing support for Joint Integration Test Command certification for Tactical Receive Segment (TRS).<br>***FY 2017 Plans:***<br>- Continuesrequired interoperability software testing support for Joint Integration Test Command certification for Tactical Receive Segment (TRS).<br>***FY 2018 Base Plans:*** | | | | | |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue required interoperability software testing support for Joint Integration Test Command certification for Tactical Receive Segment (TRS).<br>- Initiate the Networking-On-The-Move (NOTM) integration and Integrated Broadcast System (IBS) server producer capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *SCI COMMS: Product Development<br>***Articles:***<br>***Description:*** Sensitive Compartmented Information Communications (SCI COMMS): Increase of $0.153M from FY17 to FY18 supports test and evaluation activities associated with product improvement.<br>***FY 2016 Accomplishments:***<br>- Initiated maintenance of dedicated test and evaluation assets.<br>***FY 2017 Plans:***<br>- Continue maintenance of dedicated test and evaluation assets.<br>***FY 2018 Base Plans:***<br>- Initiate efforts to procure new test assets, such as controlled cryptographic items, to support security-based product improvements and ECPs.<br>***FY 2018 OCO Plans:***<br>N/A | 0.073<br>- | 0.076<br>- | 0.168<br>- | 0.000<br>- | 0.168<br>- |
| ***Title:*** *SCI COMMS: Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Initiated development of Engineering Change Proposal (ECP) to support the network refresh security-based product improvement<br>***FY 2017 Plans:***<br>- Continue development of Engineering Change Proposals for network refresh.<br>***FY 2018 Base Plans:*** | 0.126<br>- | 0.122<br>- | 0.110<br>- | 0.000<br>- | 0.110<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue development of ECPs for end-of-life/end-of-sale equipment and modernization efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *SCI COMMS: Test and Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate test and evaluation efforts which support engineering change proposals (ECPs) such as cryptographic item refresh.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 0.073<br>- | 0.000<br>- | 0.073<br>- |
| ***Title:*** *Tactical Exploitation of National Capabilities (TENCAP): Product Development & Technical Assessments<br>***Articles:***<br>***Description:*** Tactical Exploitation of National Capabilities (TENCAP): Increase of $1.702M from FY17 to FY18 supports Rapid Reliable Targeting (RRT) capability and transition.<br>***FY 2016 Accomplishments:***<br>- Continued to conduct research and development, advanced technology demonstrations, and integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE).<br>- Continued to support the congressionally mandated TENCAP office and all associated ongoing activities, to include the coordination with national agencies, the intelligence community, research laboratories, private industry, and academia, for exploration of collaborative Science and Technology (S&T)/R&D efforts to bring evolutionary intelligence capabilities to the operating forces.<br>- Continued to provide technical assessments and field utility evaluations for the integration of current and emerging intelligence capabilities into the tactical decision making process. | 4.520<br>- | 4.746<br>- | 6.448<br>- | 0.000<br>- | 6.448<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued to support operational planning and enhance operating force capabilities through the identification and development of advanced technologies for the MCISRE architecture.<br>- Continued training and education efforts by providing the operating forces with supported simulation, visualization, and improved mission planning capabilities.<br>***FY 2017 Plans:***<br>- Continue to conduct research and development, advanced technology demonstrations, and integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE).<br>- Continue to support the Congressionally mandated TENCAP office and all associated ongoing activities, to include the coordination with national agencies, the intelligence community, research laboratories, private industry, and academia, for exploration of collaborative Science and Technology (S&T)/R&D efforts to bring evolutionary intelligence capabilities to the operating forces.<br>- Continue to provide technical assessments and field utility evaluations for the integration of current and emerging intelligence capabilities into the tactical decision making process.<br>- Continue to support operational planning and enhance operating force capabilities through the identification and development of advanced technologies for the MCISRE architecture.<br>- Continue training and education efforts by providing the operating forces with supported simulation, visualization, and improved mission planning capabilities.<br>- Continue development of advanced technologies for the MCISRE architecture. Supporting MCISRE MVP development and transition into the tactical environment.<br>***FY 2018 Base Plans:***<br>- Continue to conduct research and development, advanced technology demonstrations, and integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE).<br>- Continue to support the Congressionally mandated TENCAP office and all associated ongoing activities, to include the coordination with national agencies, the intelligence community, research laboratories, private industry, and academia, for exploration of collaborative Science and Technology (S&T)/R&D efforts to bring evolutionary intelligence capabilities to the operating forces.<br>- Continue to provide technical assessments and field utility evaluations for the integration of current and emerging intelligence capabilities into the tactical decision making process.<br>- Continue to support operational planning and enhance operating force capabilities through the identification and development of advanced technologies for the MCISRE architecture. | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continue training and education efforts by providing the operating forces with supported simulation, visualization, and improved mission planning capabilities.<br>- Initiate efforts to provide transition support to Rapid Reliable Targeting (RRT).<br>- Initiate efforts for the development of Process, Exploitation, and Dissemination (PED) capability to the Command Level Intelligence Cell (CLIC)<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *MAGTF Secondary Imagery Dissemination System (MSIDS): Test and Evaluation<br>***Articles:***<br>***Description:*** MAGTF Secondary Imagery Dissemination System (MSIDS): Increase of $0.171M from FY17 to FY18 supports test and evaluation effort for Base Station and Outstation data controllers to improve data throughput.<br>***FY 2016 Accomplishments:***<br>-N/A<br>***FY 2017 Plans:***<br>-N/A<br>***FY 2018 Base Plans:***<br>-Initiate test and evaluation effort for Base Station and Outstation data controllers to improve data throughout for compatibility with a new organic tactical radio waveform.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 0.171<br>- | 0.000<br>- | 0.171<br>- |
| ***Title:*** *Tactical Remote Sensor System (TRSS): Test and Evaluation<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:*** | 0.000<br>- | 0.000<br>- | 0.802<br>- | 0.000<br>- | 0.802<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Will initiate engineering efforts to determine the acceptability of the Signature Data Recorder (SDR),Hand Held Programmable Monitor (HHPM) and Common Sensor Radio (CSR) to include hardware and software testing<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Tactical Remote Sensor System (TRSS): Product Development<br>***Articles:***<br>***Description:*** Tactical Remote Sensor System (TRSS)Program: Increase of $.903M from FY17 to FY18 supports test and evaluation of the Signature Data Recorder, Hand-Held Programmable Monitor and Common Sensor Radio.<br>***FY 2016 Accomplishments:***<br>- Continued providing engineering and technical management support required for developing critical upgrades to TRSS systems.<br>***FY 2017 Plans:***<br>- Continue engineering and technical management support required for developing critical upgrades to TRSS systems, such as software changes to properly receive, parse, and display messages from systems with improved radios as well as interface directly with these systems to program them.<br>***FY 2018 Base Plans:***<br>- Continue development of software changes to properly receive, parse, and display messages from systems with improved radios as well as interface directly with these systems to program them. Will initiate development of hardware and software to replace obsolete Hand Held Programmable Monitors (HHPM) which will be utilized to configure and monitor the operation of the sensor network.<br>***FY 2018 OCO Plans:***<br>N/A | 0.100<br>- | 0.099<br>- | 0.200<br>- | 0.000<br>- | 0.200<br>- |
| ***Title:*** *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Product Development<br>***Articles:***<br>***Description:*** Increase from FY17 to FY18 initiates development and integration of Mod Case 2.0, sleeve design integration, and software defined capability.<br>***FY 2016 Accomplishments:*** | 1.588<br>- | 2.625<br>- | 4.558<br>- | 0.000<br>- | 4.558<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued development for TSCS technology refresh and insertions as well as potential engineering changes.<br>***FY 2017 Plans:***<br>- Complete development for Digital Network Intelligence (DNI)/ Dual Receiver server sleeve developmental testing and Operational Testing (DT/OT) in preparation for fielding.<br>- Initiate development and integration of Digital Network Intelligence (DNI)/ Dual Receiver Replacement (DRR) software to include Legacy Signals of Interest (SOI), as well as firmware upgrades, hardware/software development, and mods case/PIK development.<br>***FY 2018 Base Plans:***<br>- Continue development and integration of Digital Network Intelligence (DNI)/ Dual Receiver Replacement (DRR) software to include Legacy Signals of Interest (SOI), as well as firmware upgrades, hardware/software development, and mods case/PIK development.<br>- Initiate development and integration of Mod Case 2.0, sleeve design integration, and software defined capability, integration and testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Test and Evaluation | 0.000 | 2.647 | 0.560 | 0.000 | 0.560 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Continue test and evaluation efforts for ongoing TSCS technology refresh and insertions as well as potential engineering changes.<br>- Initiate test and evaluation of the DNI/DRR and legacy SOI, Software Defined Receiver (SDR) development and integration for future capability insert.<br>***FY 2018 Base Plans:***<br>- Initiate Mod Case 2.0 testing and continue SDR development and integration for future capability.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Ground-Based Operational Surveillance System: Test and Evaluation | 0.000 | 0.000 | 1.800 | 0.000 | 1.800 |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Ground-Based Operational Surveillance System: Increase of $1.800M from FY17 to FY18 supports sensor network development and testing in support of technical refresh effort.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate test and evaluation efforts to develop ECPs.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Support | 0.024 | 0.057 | 0.040 | 0.000 | 0.040 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>- Continued to provide program support and management for TSCS technology refresh and insertions as well as potential engineering changes.<br>***FY 2017 Plans:***<br>- Continue to provide program support and management for ongoing developmental testing, engineering drawings, environmental testing for server sleeves.<br>***FY 2018 Base Plans:***<br>- Continue to provide program support and management for ongoing developmental testing, engineering drawings, environmental testing for server sleeves.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Technical Control and Analysis Center (TCAC): Product Development | 1.894 | 3.019 | 3.394 | 0.000 | 3.394 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued integration, testing, and selection of next generation TCAC analysis tools and hardware components such as the Remote Analysis Work Station (RAWS) and Cross Domain Solution (CDS) into the TCAC FoS.<br>***FY 2017 Plans:***<br>- Continue integration and testing of next generation TCAC analysis tools and hardware components such as the Transportable Workstation (TWS), JICD 4.2 net centric analytic capability, and peripheral refresh assessment into the TCAC FoS.<br>***FY 2018 Base Plans:***<br>- Continue system development and system design for JICD 4.2 and TWS software baseline.<br>- Initiate research and development in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Joint Worldwide Intel Comms Sys (JWICS): Product Development<br>***Articles:***<br>***Description:*** Joint Worldwide Intel Comms Sys (JWICS) program: Decrease $2.8M FY17 to FY18 reflects completion of development effort to engineer a solution to provide JWICS services in the tactical environment.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>The SCI Enterprise Office (SEO) will conduct research, development, testing and evaluation (RDT&E) to engineer a<br>deployable voice, video, data, and circuit realignment solution that will provide the warfighter JWCIS services in the<br>tactical environment. The solution(s) developed will re-engineer the High Bandwidth Special Intelligence Palletized<br>Terminal (HBSI-PT) communications path to reduce the latency for Marine Corps Joint Worldwide Intelligence Communication (JWICS) network, by development of a tactical Point of Presence (POP). The solution(s) will house | 0.000<br>- | 2.800<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| enterprise services such as Active Directory (AD), Dynamic Host Control Protocol (DHCP), distributed files services<br>(DFS), data storage, and print services behind a tactical node. This effort will also research the potential use of cloud services for continuity of tactical operations support. The solution(s) will increase the warfighters ability to produce useful and timely intelligence in a reliable, efficient manner.<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Technical Control and Analysis Center (TCAC): Support<br>***Articles:*** | 1.078<br>- | 0.835<br>- | 0.298<br>- | 0.000<br>- | 0.298<br>- |
| ***FY 2016 Accomplishments:***<br>- Continued technical support for integration of next generation TCAC analysis tools and hardware components such as the RAWS and CDS into the TCAC FoS.<br>***FY 2017 Plans:***<br>- Continue technical support for integration of next generation TCAC analysis tools and hardware components such as the TWS into the TCAC FoS.<br>***FY 2018 Base Plans:***<br>- Continue technical support of improvements to TCAC baseline.<br>- Initiate technical support for next TCAC hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/ CDS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** *Technical Control and Analysis Center (TCAC): Test and Evaluation<br>***Articles:*** | 0.541<br>- | 1.644<br>- | 1.357<br>- | 0.000<br>- | 1.357<br>- |
| ***FY 2016 Accomplishments:*** | | | | | |

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|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued Conducted developmental testing on TCAC Sensitive Compartmented Information (SCI) software, integration testing on RAWS and CDS, conducted security and certification testing and evaluation on CDS, and assessment evaluations on TWS hardware refresh.<br>***FY 2017 Plans:***<br>- Continue developmental tests, integration, and validation/verification evaluation for integration of next generation TCAC analysis tools and hardware components such as JICD 4.2 and the TWS software baseline into the TCAC FoS.<br>***FY 2018 Base Plans:***<br>- Continue integration and testing of JICD 4.2 and TWS software baseline.<br>- Initiate research and test design in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 13.373 | 24.187 | 30.886 | 0.000 | 30.886 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/474703: *TCAC* | 11.202 | 4.874 | 1.581 | 3.000 | 4.581 | 9.991 | 5.666 | 5.917 | 6.049 | Continuing | Continuing |
| • PMC/474761: *IAS* | 5.603 | 22.326 | 8.396 | - | 8.396 | 9.806 | 8.107 | 8.369 | 8.615 | Continuing | Continuing |
| • PMC/700000: *IAS SPARES* | 0.100 | 0.154 | 0.158 | - | 0.158 | 0.161 | 0.167 | 0.170 | 0.173 | Continuing | Continuing |
| • PMC/474709: *CIHEP* | 3.931 | 29.392 | 3.525 | - | 3.525 | 3.666 | 4.334 | 3.610 | 3.846 | Continuing | Continuing |
| • PMC/474702: *TSCS* | 8.608 | 13.484 | 9.496 | - | 9.496 | 12.580 | 6.343 | 6.750 | 11.934 | Continuing | Continuing |
| • PMC/474701: *CESAS* | 0.842 | 12.243 | 9.223 | - | 9.223 | 4.556 | 0.188 | 0.068 | 0.000 | Continuing | Continuing |
| • PMC/474700: *SCI COMMS* | 1.355 | 7.136 | 6.402 | - | 6.402 | 7.325 | 1.859 | 0.246 | 0.251 | Continuing | Continuing |
| • PMC/700003: *TRSS SPARES* | 0.100 | 0.063 | 0.099 | - | 0.099 | 0.165 | 0.101 | 0.101 | 0.103 | Continuing | Continuing |
| • PMC/700005: *MSIDS SPARES* | 0.100 | 0.099 | 0.099 | - | 0.099 | 0.099 | 0.101 | 0.103 | 0.105 | Continuing | Continuing |
| • PMC/474752: *IBR* | 0.053 | 1.420 | 6.697 | - | 6.697 | 6.704 | 1.512 | 1.495 | 1.510 | Continuing | Continuing |
| • PMC/474713: *TRSS* | 0.848 | 1.536 | 2.638 | - | 2.638 | 3.058 | 0.876 | 0.783 | 0.687 | Continuing | Continuing |
| • PMC/474719: *MSIDS* | 0.000 | 1.500 | 2.503 | - | 2.503 | 1.558 | 0.000 | 0.000 | 0.000 | 0.000 | 5.561 |
| • PMC/700001: *SCI COMMS* | 0.362 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.362 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4747XX: *G-BOSS* | 0.000 | 0.000 | 1.200 | - | 1.200 | 1.826 | 2.100 | 0.000 | 0.000 | 0.000 | 5.126 |
| • PMC/643800: *G-BOSS* | 8.153 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 8.153 |
| • PMC/4747XY: *JWICS* | 4.407 | 29.963 | 4.098 | - | 4.098 | 4.615 | 4.701 | 4.792 | 4.887 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

(U) SCI COMMS: SCI COMMS leverages SSC-LANT support for Engineering Change Proposal support and existing SSC-LANT contract for test asset procurement.

(U) TCAC: The acquisition of components for the TCAC will maximize the use of existing equipment, NDI/COTS/GFE equipment/software.

(U) TRSS: TRSS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) MSIDS: MSIDS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) IER: IER makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) IAS: IAS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) CIHEP: CIHEP makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) IBR: IBR software upgrades are developed at Naval laboratories and integrated into the system. IBR makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) TENCAP: All work will be led in-house and necessary contractor support will be acquired using existing contracts. Research, test and integrate new technology and conduct advanced technology demonstrations to identify the most appropriate programs which are mature for integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISR-E).

(U) CESAS: CESAS II production will consist of COTS and NDI integration into an existing GOTS architecture. Production efforts will be conducted at Naval laboratories.

(U) TSCS: TSCS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

(U) G-BOSS: Tech refresh for sustainability to ensure operational readiness of the G-BOSS assets, assumes required engineering and logistics refresh funded per additional capability initiative.

(U) JWICS: JWICS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | Project (Number/Name)<br>2272 / *Intel Command and Control (C2) Sys* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cummulative Funding | Various | Various : Various | 29.929 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 29.929 | - |
| CESAS | WR | SPAWAR : CHARLESTON, SC | 2.300 | 0.475 | Dec 2015 | 0.484 | Dec 2016 | 3.294 | Dec 2017 | - | | 3.294 | 0.000 | 6.553 | - |
| IAS | WR | SPAWAR : CHARLESTON, SC | 0.000 | 1.725 | Oct 2015 | 1.201 | Nov 2016 | 1.737 | Nov 2017 | - | | 1.737 | 0.000 | 4.663 | - |
| IAS | C/CPFF | SPAWAR-A3 : CHARLESTON, SC | 0.000 | 0.039 | Apr 2016 | 1.780 | Feb 2017 | 3.125 | Feb 2018 | - | | 3.125 | 0.000 | 4.944 | - |
| TENCAP | C/CPFF | DTIC-1 : FT. BELVOIR | 7.709 | 3.838 | Nov 2015 | 1.086 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 12.633 | - |
| TENCAP | WR | SPAWAR : CHARLESTON, SC | 1.110 | 0.672 | Jan 2016 | 0.433 | Oct 2016 | 0.423 | Oct 2017 | - | | 0.423 | Continuing | Continuing | Continuing |
| TENCAP | C/CPFF | DTIC-2 : FT. BELVOIR | 0.000 | 0.010 | Jul 2016 | 3.227 | Jan 2017 | 5.959 | Oct 2017 | - | | 5.959 | 0.000 | 9.196 | - |
| TSCS | WR | SPAWAR : CHARLESTON, SC | 3.354 | 1.588 | Dec 2015 | 2.625 | Dec 2016 | 4.558 | Mar 2018 | - | | 4.558 | Continuing | Continuing | Continuing |
| TCAC | C/CPFF | SPAWAR2 : Charleston, SC | 1.344 | 0.228 | Jan 2016 | 0.342 | Jan 2017 | 0.228 | Jan 2018 | - | | 0.228 | 0.000 | 2.142 | - |
| TCAC | WR | SPAWAR8 : San Diego, CA | 7.260 | 1.666 | Jan 2016 | 2.677 | Jan 2017 | 3.166 | Jan 2018 | - | | 3.166 | Continuing | Continuing | Continuing |
| TRSS | WR | SPAWAR-A2 : CHARLESTON, SC | 0.095 | 0.100 | Nov 2015 | 0.099 | Nov 2016 | 0.200 | Nov 2017 | - | | 0.200 | Continuing | Continuing | Continuing |
| SCI COMMS | C/FFP | CECOM : ABERDEEN, MD | 0.000 | 0.073 | Mar 2016 | 0.076 | Mar 2017 | 0.168 | Mar 2018 | - | | 0.168 | Continuing | Continuing | Continuing |
| TENCAP | WR | SPAWAR : SAN DIEGO, CA | 0.000 | 0.000 | | 0.000 | | 0.066 | Nov 2017 | - | | 0.066 | 0.000 | 0.066 | - |
| IBR | Various | VARIOUS : VARIOUS | 0.000 | 0.100 | Feb 2016 | 0.111 | Dec 2016 | 0.474 | Dec 2017 | - | | 0.474 | 0.000 | 0.685 | - |
| JWICS | C/CPFF | DTIC-2 : FT. BELVOIR | 0.000 | 0.000 | | 2.800 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 2.800 | - |
| | | **Subtotal** | 53.101 | 10.514 | | 16.941 | | 23.398 | | - | | 23.398 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | Not Specified : Not Specified | 2.674 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.674 | - |
| SCI COMMS | WR | SPAWAR : Charleston, SC | 0.059 | 0.113 | Feb 2016 | 0.122 | Feb 2017 | 0.110 | Feb 2018 | - | | 0.110 | Continuing | Continuing | Continuing |
| SCI COMMS | WR | SPAWAR-2 : Charleston, SC | 0.000 | 0.013 | Feb 2017 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.013 | - |
| TSCS | Various | MCSC20 : QUANTICO, VA | 0.101 | 0.024 | Aug 2016 | 0.057 | Aug 2017 | 0.040 | Aug 2018 | - | | 0.040 | Continuing | Continuing | Continuing |
| TCAC | MIPR | DTIC : FT Belvoir, VA | 0.611 | 1.072 | Apr 2016 | 0.545 | Apr 2017 | 0.000 | | - | | 0.000 | 0.000 | 2.228 | - |
| TCAC | WR | SPAWAR-P : San Diego, CA | 3.568 | 0.000 | | 0.275 | Apr 2017 | 0.283 | Apr 2018 | - | | 0.283 | Continuing | Continuing | Continuing |
| TCAC | Various | MCSC26 : QUANTICO, VA | 0.000 | 0.006 | Sep 2016 | 0.015 | Sep 2017 | 0.015 | Sep 2018 | - | | 0.015 | 0.000 | 0.036 | - |
| IAS | C/CPFF | DTIC : Fort Belvoir, VA | 1.178 | 0.570 | Apr 2016 | 0.000 | | 0.662 | Apr 2018 | - | | 0.662 | 0.000 | 2.410 | - |
| IAS | C/FFP | CECOM : FT. BELVOIR, VA | 0.000 | 0.000 | | 0.933 | Nov 2016 | 0.304 | Oct 2017 | - | | 0.304 | 0.000 | 1.237 | - |
| CESAS | Various | MCSC9 : QUANTICO, VA | 0.751 | 0.030 | Sep 2016 | 0.017 | Sep 2017 | 0.025 | Sep 2018 | - | | 0.025 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 8.942 | 1.828 | | 1.964 | | 1.439 | | - | | 1.439 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Years Cumulative Funding | Various | Various : Various | 8.033 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.033 | - |
| TSCS | WR | SPAWAR : CHARLESTON, SC | 0.719 | 0.000 | | 2.647 | Dec 2016 | 0.560 | Dec 2017 | - | | 0.560 | Continuing | Continuing | Continuing |
| TCAC | C/CPFF | SPAWAR8 : CHARLESTON, SC | 0.000 | 0.541 | Feb 2016 | 0.841 | Feb 2017 | 0.841 | Feb 2018 | - | | 0.841 | 0.000 | 2.223 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | Project (Number/Name)<br>2272 / *Intel Command and Control (C2) Sys* | |

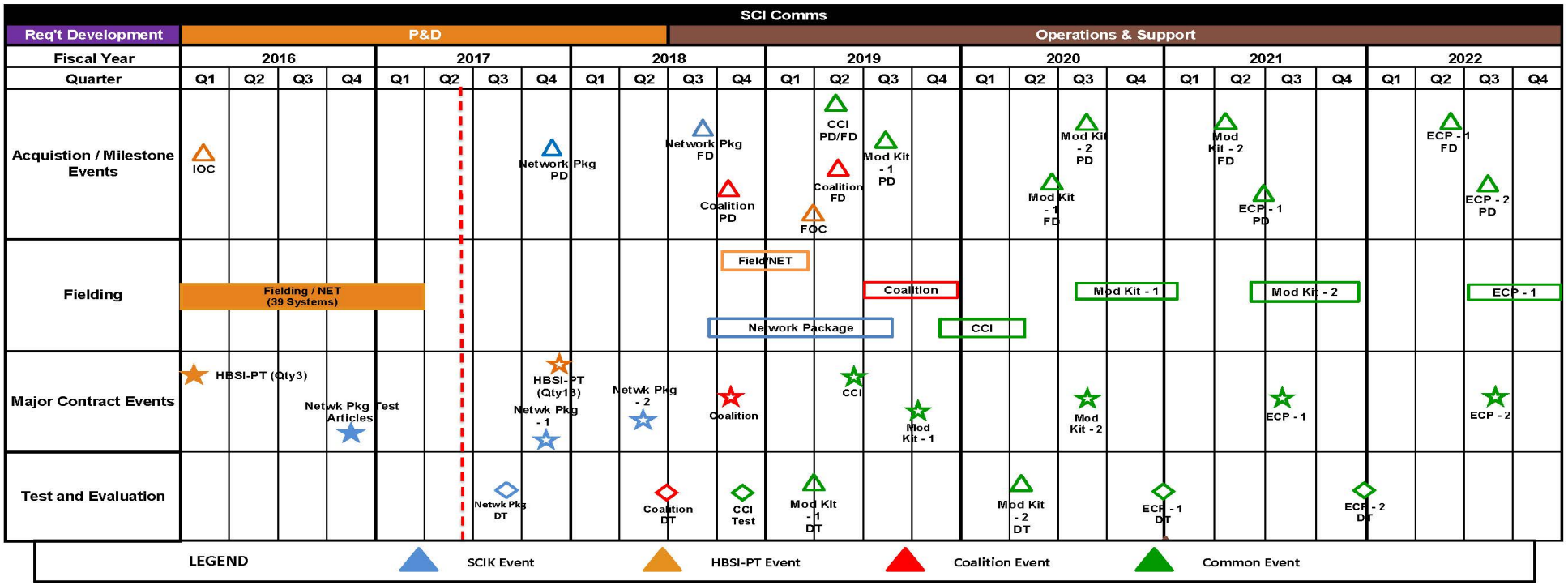
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCAC | C/CPFF | SPAWAR9 : SAN DIEGO, CA | 0.000 | 0.000 | | 0.803 | Jan 2017 | 0.516 | Jan 2018 | - | | 0.516 | 0.000 | 1.319 | - |
| TRSS | WR | SPAWAR-A1 : CHARLESTON, SC | 0.000 | 0.000 | | 0.000 | | 0.802 | Dec 2017 | - | | 0.802 | 0.000 | 0.802 | - |
| IAS | C/FFP | DTIC : FT. BELVOIR, VA | 0.000 | 0.000 | | 0.299 | Apr 2017 | 0.500 | Apr 2018 | - | | 0.500 | 0.000 | 0.799 | - |
| SCI COMMS | TBD | MCIA : QUANTICO, VA | 0.000 | 0.000 | | 0.000 | | 0.073 | Mar 2018 | - | | 0.073 | Continuing | Continuing | Continuing |
| G-BOSS | WR | NSWC CRANE : CRANE, IN | 0.000 | 0.000 | | 0.000 | | 1.800 | Feb 2018 | - | | 1.800 | 0.000 | 1.800 | - |
| CIHEP | WR | SPAWAR-A4 : CHARLESTON, SC | 0.000 | 0.490 | Nov 2015 | 0.692 | Nov 2016 | 0.325 | Nov 2017 | - | | 0.325 | 0.000 | 1.507 | - |
| IAS | WR | SPAWAR : CHARLESTON, SC | 0.000 | 0.000 | | 0.000 | | 0.461 | Nov 2017 | - | | 0.461 | 0.000 | 0.461 | - |
| MSIDS | WR | SPAWAR : CHARLESTON, SC | 0.000 | 0.000 | | 0.000 | | 0.171 | Dec 2017 | - | | 0.171 | 0.000 | 0.171 | - |
| | | **Subtotal** | 8.752 | 1.031 | | 5.282 | | 6.049 | | - | | 6.049 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 70.795 | 13.373 | | 24.187 | | 30.886 | | - | | 30.886 | - | - | - |

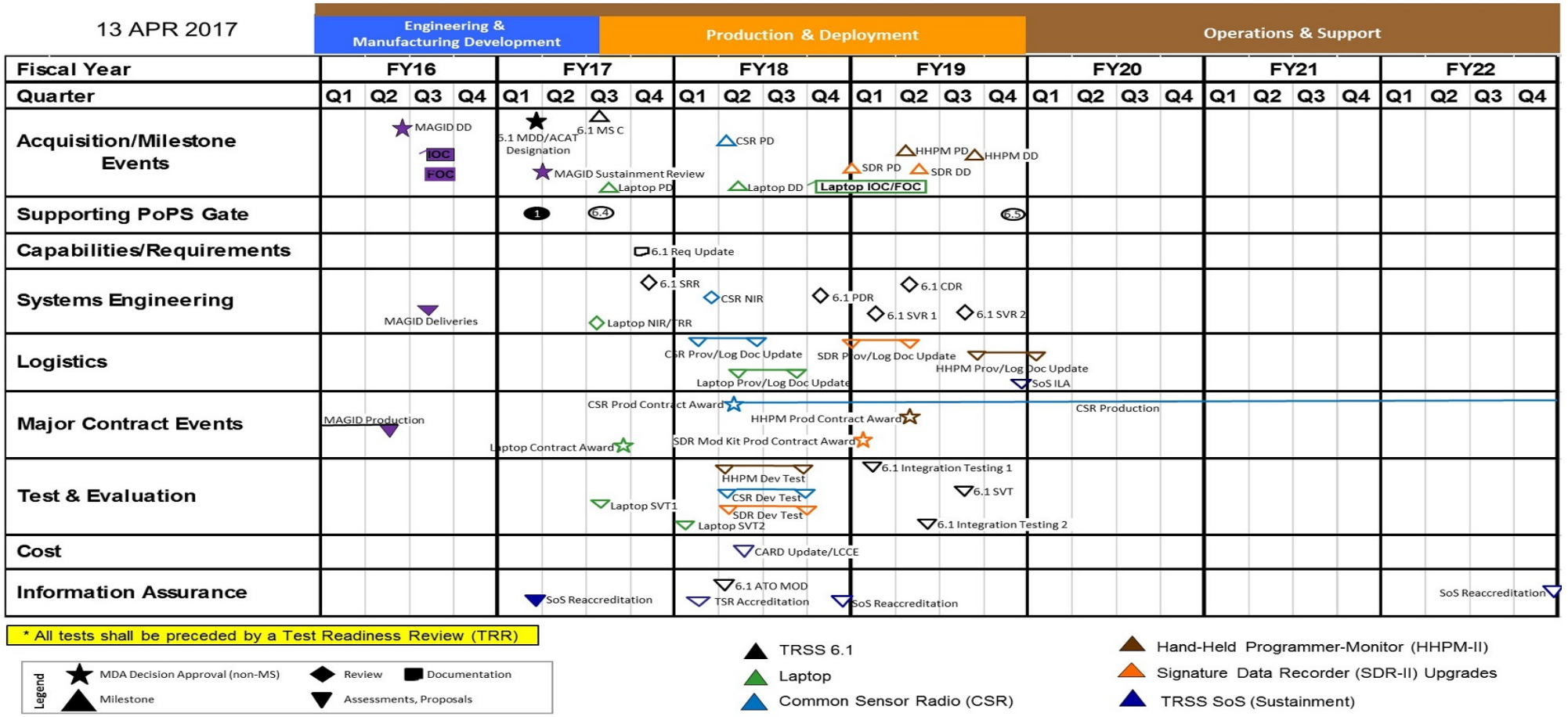
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

# TRSS SoS By Budget Schedule FY16-FY22

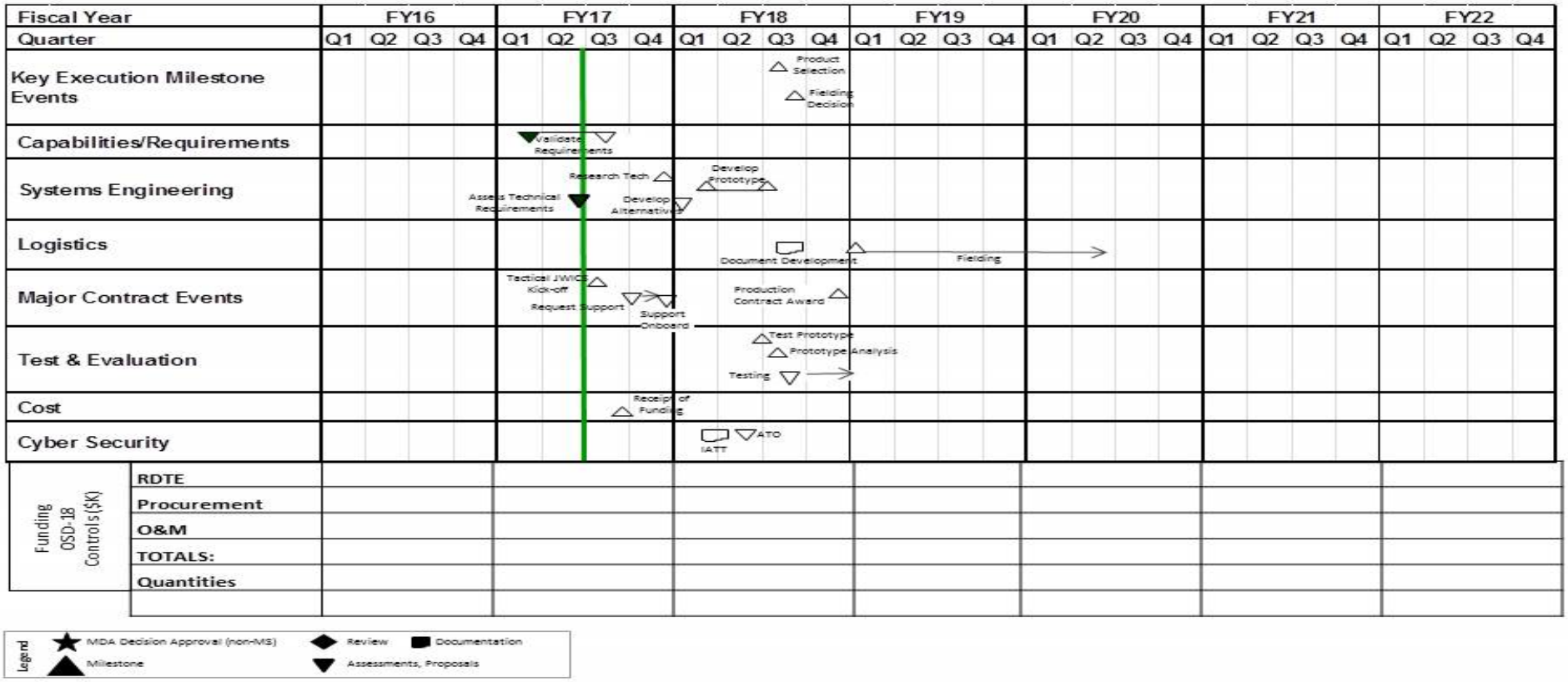


| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

MARINE CORPS INTELLIGENCE ACTIVITY

## Tactical JWICS Program Execution Schedule

2 March 2017

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| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

## IBR Program Schedule

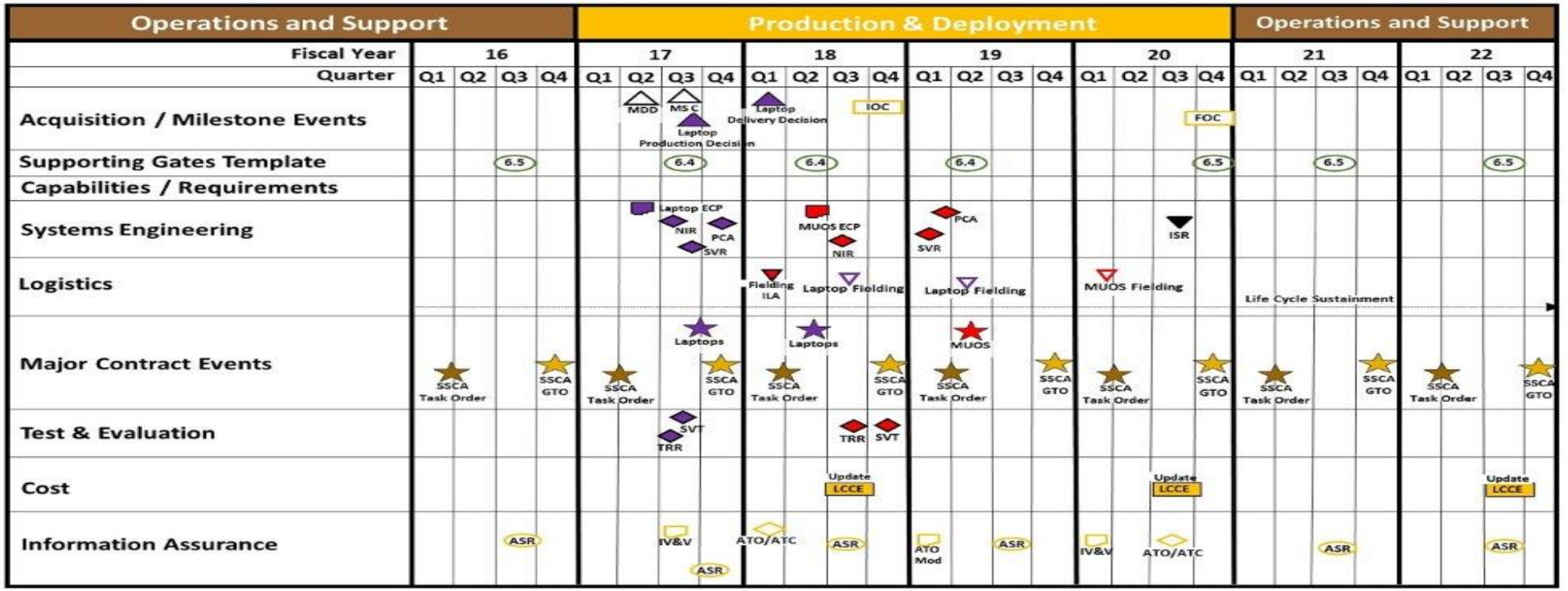
| Fiscal Year | 16 | | | | 17 | | | | 18 | | | | 19 | | | | 20 | | | | 21 | | | | 22 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quarter | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Acquisition / Milestone Events | | PD<br>Initial V4 | | | | | | PD/ MDD<br>USB ENTR Life Cycle Sustainment | | | | | | DD | | | | IOC | | | | | | | | FOC | | |
| Capabilities / Requirements | AAO<br>TOECR | CIB<br>FOC | | APBA<br>Rev 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Systems Engineering | | TRS 4.0 | | | | TRS 5.0 | | SAR | | | TRS 6.0 | | | | | | | | TRS 7.0 | | | | | | | | | |
| Logistics | | JTT/CTT Disposal | | | | Fielding IAS | | Fielding CAC2S<br>Receive Test Assets | | | Receive Addl Test Assets | | | Receive Incr 1 | | | | Receive Incr 2 | | | | Receive Incr 3 | | | | Receive Incr 4 | | |
| Major Contract Events | | Test Assets<br>USB ENTR CIB Upgrade | | | | Addl Test Assets | | | | Incr 1 | | | | Incr 2 | | | | Incr 3 | | | | Incr 4 | | | | Incr 5 | | |
| Test & Evaluation | | | | | | JTIC Test | | NSA Cert | | TRS JITC | | | | | | | | TRS JITC | | | | TRS JITC | | | | TRS JITC | | |
| Cost | | LCCE | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IA | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

ENTR/NOTM Integration

Legend: ★ MDA Decision Approval (non-MS) ◆ Review ▬ Documentation ▲ Milestone / Key Acquisition Event ▼ Assessments, Proposals

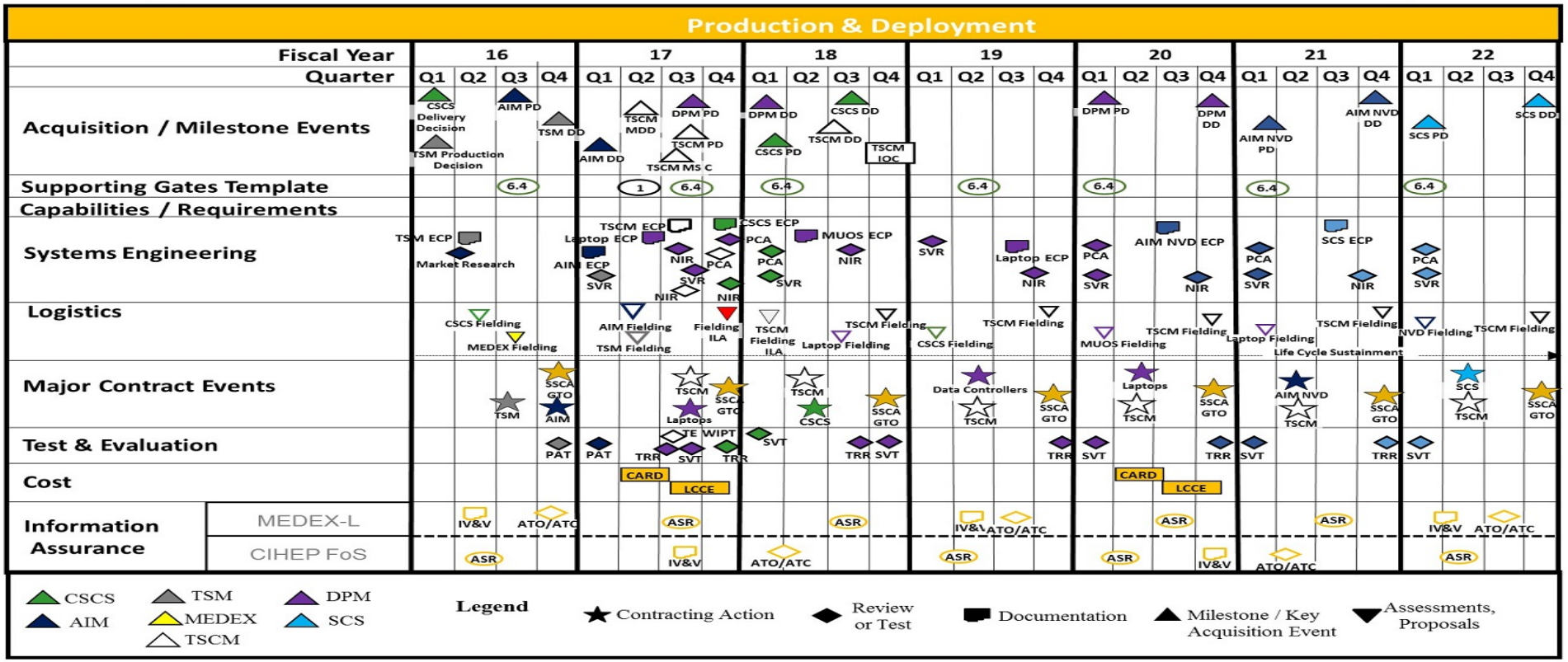
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

# MSIDS Program Schedule



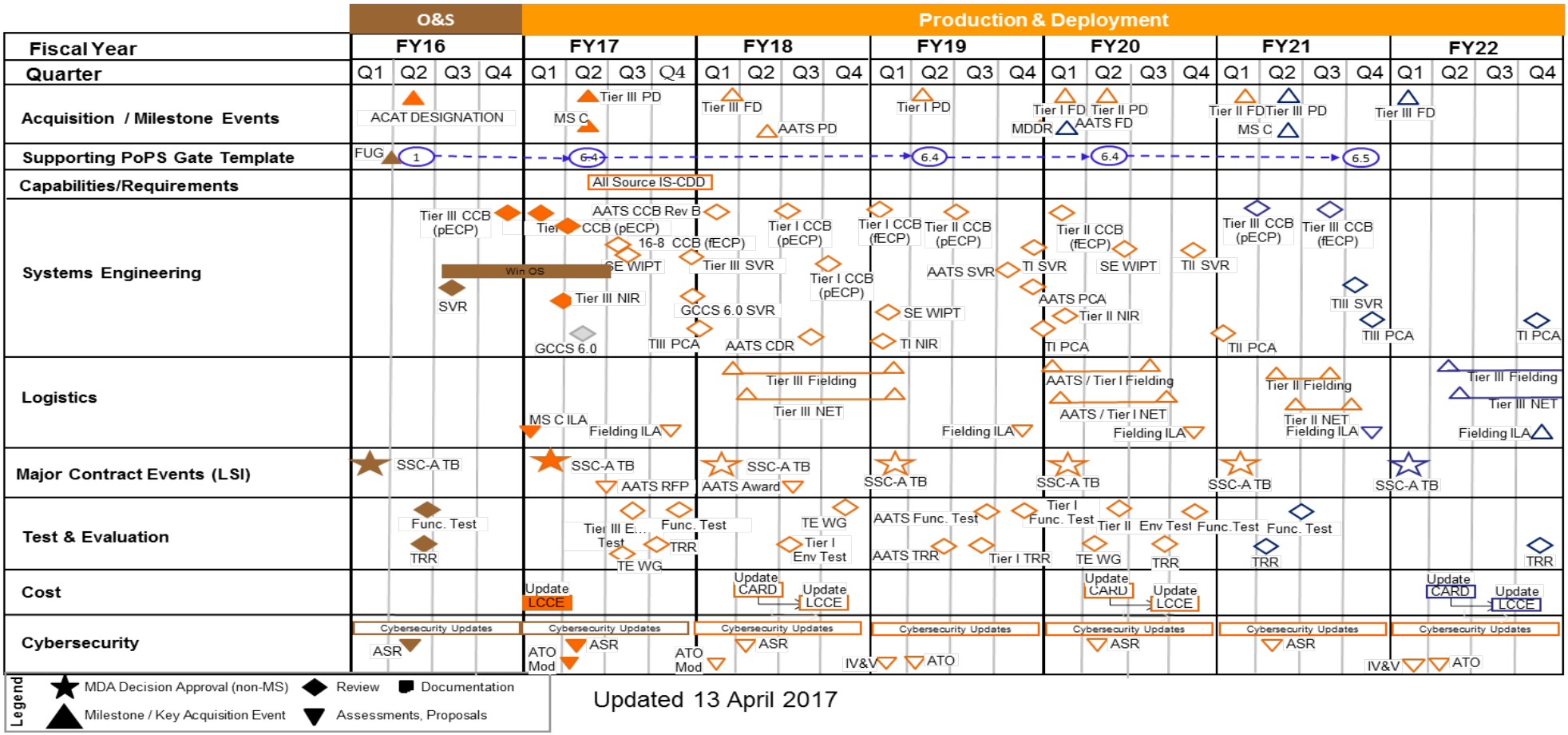
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

# CIHEP FoS Program Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

# IAS FoS Schedule 16-22 IAS FOS

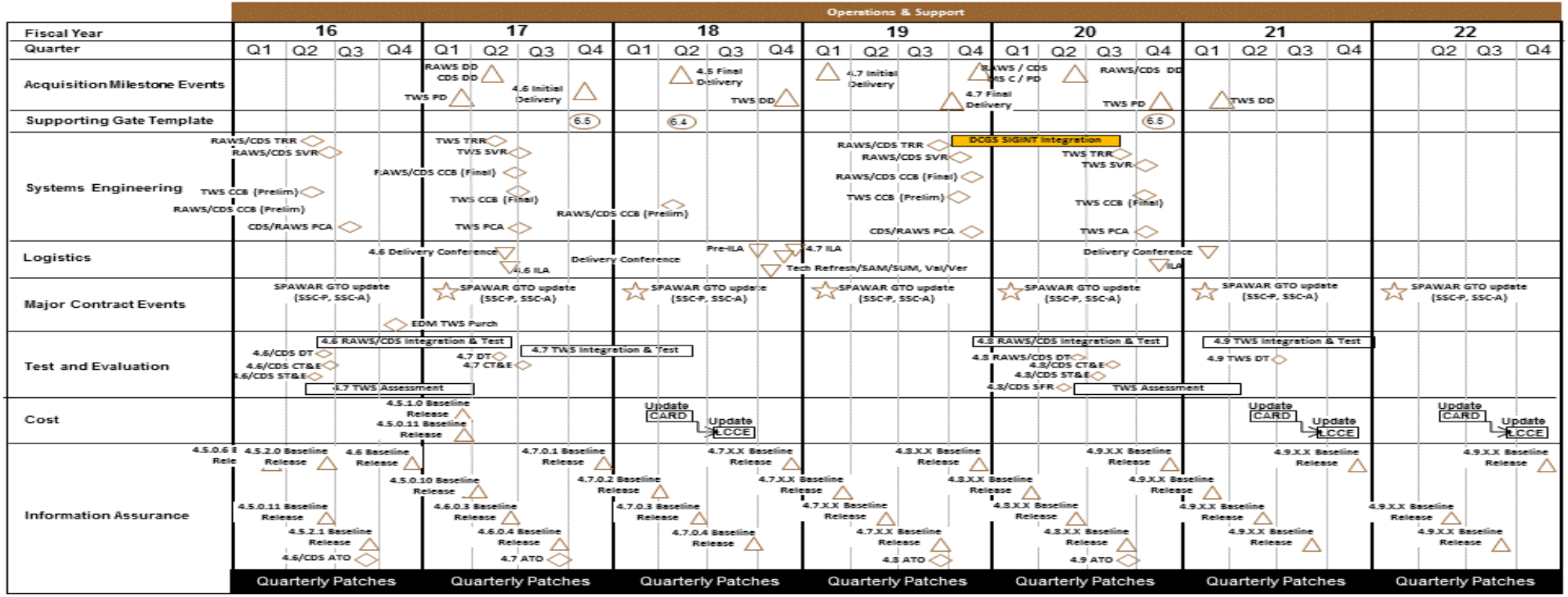



Updated 13 April 2017

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

**MARINE CORPS SYSTEMS COMMAND**
HOME OF THE MARINE CORPS ACQUISITION PROFESSIONAL

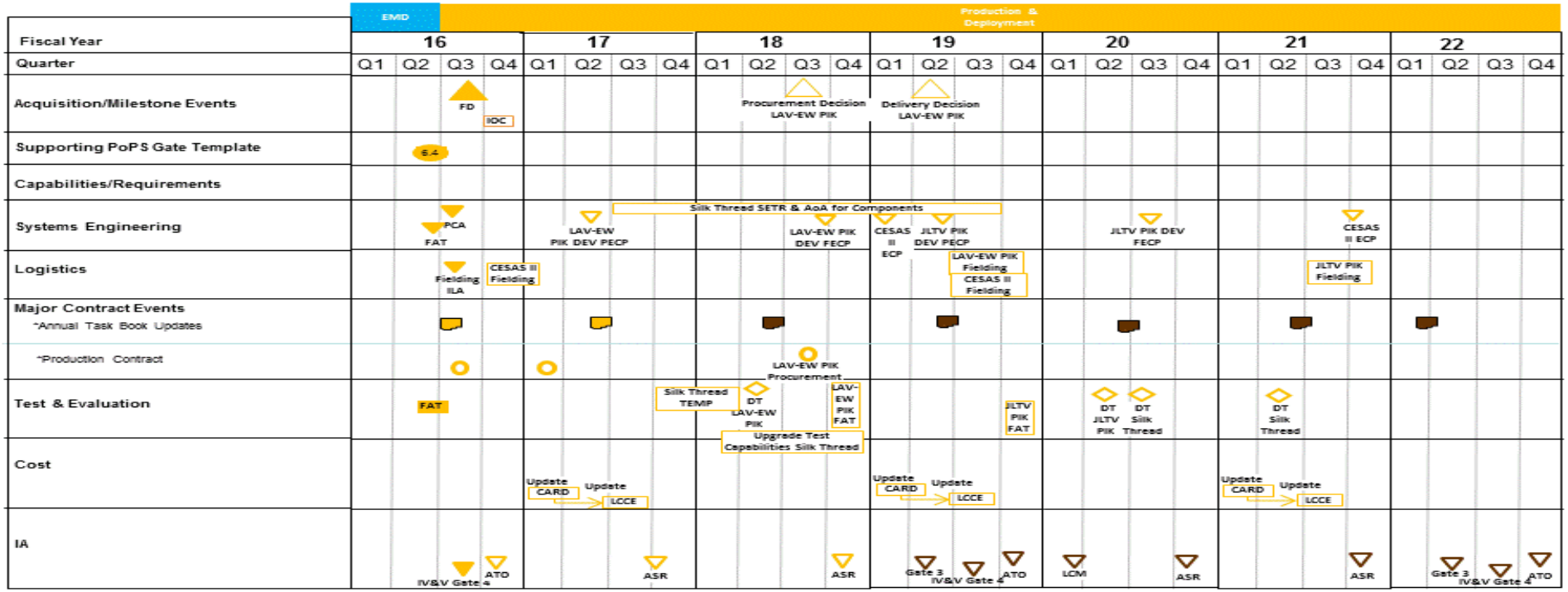
## TCAC Program Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

**MARINE CORPS SYSTEMS COMMAND**
HOME OF THE MARINE CORPS ACQUISITION PROFESSIONAL

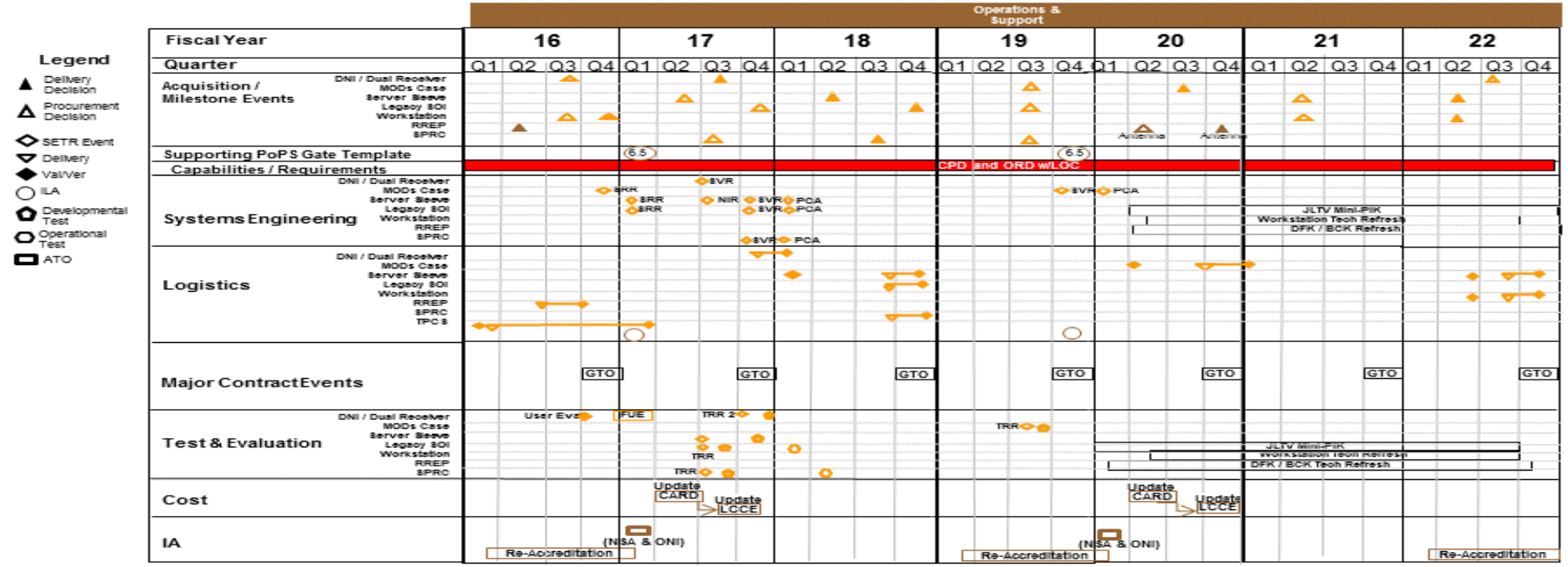
## CESAS II Program Schedule



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

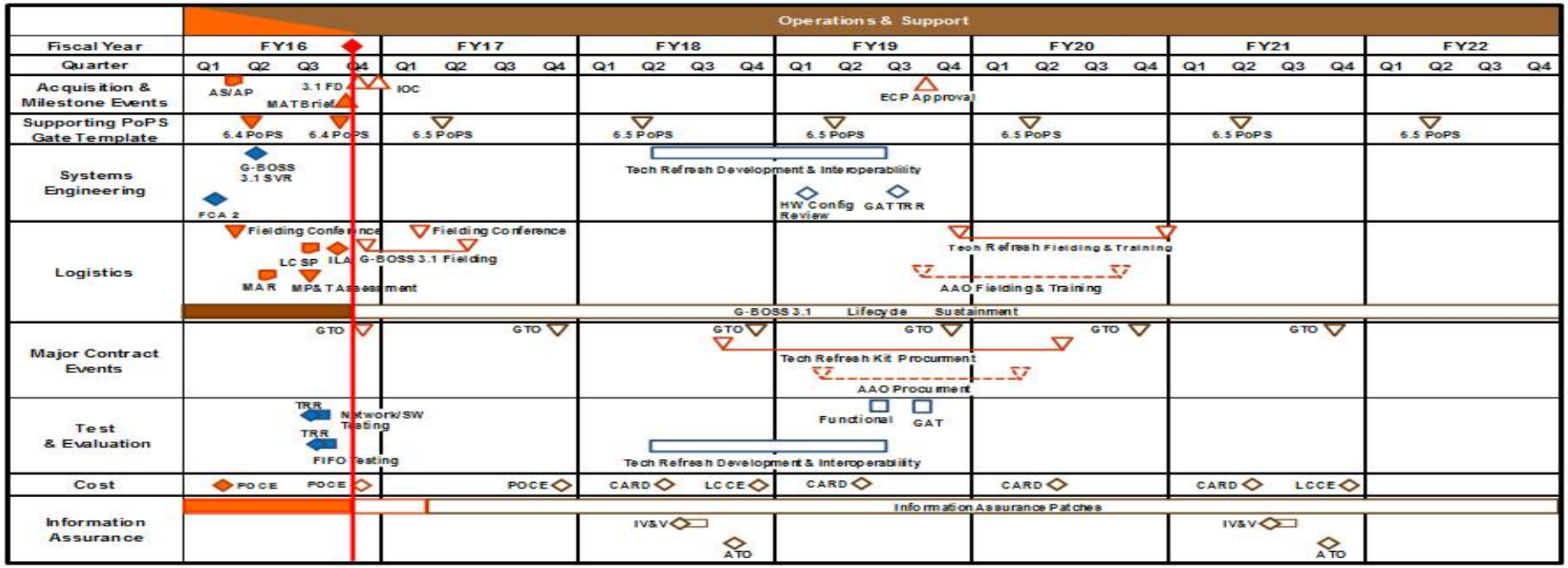
**MARINE CORPS SYSTEMS COMMAND**
HOME OF THE MARINE CORPS ACQUISITION PROFESSIONAL

**TSCS (RREP and TPCS) Program Schedule**



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

## GBOSS PROGRAM SCHEDULE



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2272*** | | | | |
| TCAC Procurement Decision (HW/SW Laptop Refresh) (TWS) | 1 | 2017 | 1 | 2017 |
| TCAC Delivery Decision (RAWS and CDS) | 2 | 2017 | 2 | 2017 |
| TCAC Fielding Decision (HW/SW Server Refresh) (RAWS and CDS) | 2 | 2017 | 2 | 2017 |
| TCAC Delivery Decision (TWS) | 4 | 2018 | 4 | 2018 |
| IAS MS C Decision | 2 | 2017 | 2 | 2017 |
| IAS Tier III Procurement Decision | 2 | 2017 | 2 | 2017 |
| IAS Advanced Analytics Production Decision | 2 | 2018 | 2 | 2018 |
| IAS Tier III Fielding Decision | 1 | 2018 | 1 | 2018 |
| CESAS LAV/EW PIK Procurement Decision | 3 | 2018 | 3 | 2018 |
| CESAS II Initial Operational Capability (IOC) | 4 | 2016 | 4 | 2016 |
| SCI COMMS FOC (HBSI-PT) | 1 | 2019 | 1 | 2019 |
| SCI COMMS Network Package Fielding Decision | 3 | 2018 | 3 | 2018 |
| SCI COMMS Network Package Fielding | 3 | 2018 | 3 | 2019 |
| TRSS Final Operational Capability (FOC) MAGID II | 3 | 2016 | 3 | 2016 |
| TRSS MDD/ACAT Designation 6.1 | 1 | 2017 | 1 | 2017 |
| TRSS Sustainment Review MAGID II | 1 | 2017 | 1 | 2017 |
| TRSS Milestone "C" Family of Systems (FOS) 6.1 Technical Refresh | 3 | 2017 | 3 | 2017 |
| TRSS Procurement Decision Sensor Monitoring Group (SMG) / Sensor Monitoring Group-Lite (SMG-L) Components (Laptops) | 3 | 2017 | 3 | 2017 |
| TRSS Procurement Decision Components - Common Sensor Radio (CSR) | 2 | 2018 | 2 | 2018 |
| TRSS Delivery Descision SMG/SMG-LITE Components (Laptops) | 2 | 2018 | 2 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| TRSS IOC/FOC SMG/SMG-LITE Components (Laptops) | 4 | 2018 | 4 | 2018 |
| TRSS Procurement Decision Signature Data Recorder (SDR) | 1 | 2019 | 1 | 2019 |
| TRSS Procurement Decision Hand Held Programmable Monitor (HHPM) | 2 | 2019 | 2 | 2019 |
| TRSS Delivery Decision Signature Data Recorder (SDR) | 2 | 2019 | 2 | 2019 |
| TRSS Delivery Decision Hand Held Programmable Monitor (HHPM) | 3 | 2019 | 3 | 2019 |
| MSIDS MDD | 2 | 2017 | 2 | 2017 |
| MSIDS Milestone C | 3 | 2017 | 3 | 2017 |
| MSIDS Production Decision (Laptops) | 3 | 2017 | 3 | 2017 |
| MSIDS Delivery Decision (Laptops) | 1 | 2018 | 1 | 2018 |
| MSIDS IOC | 3 | 2018 | 3 | 2018 |
| MSIDS FOC | 3 | 2020 | 3 | 2020 |
| CIHEP Full Rate Production Decision Technical Surveillance Modules (TSM) | 1 | 2016 | 1 | 2016 |
| CIHEP Delivery Decision CSCS 1 | 1 | 2016 | 1 | 2016 |
| CIHEP FRP Decision Advanced Imagery Module (AIM) | 3 | 2016 | 3 | 2016 |
| CIHEP Delivery Decision TSM | 4 | 2016 | 4 | 2016 |
| CIHEP Delivery Decision AIM | 1 | 2017 | 1 | 2017 |
| CIHEP MDD Technical Surveillance Countermeasures (TSCM) | 2 | 2017 | 2 | 2017 |
| CIHEP Milestone "C" TSCM | 3 | 2017 | 3 | 2017 |
| CIHEP Full Rate Production Decision DPM | 3 | 2017 | 3 | 2017 |
| CIHEP Full Rate Production Decision TSCM | 3 | 2017 | 3 | 2017 |
| CIHEP Delivery Decision DPM | 1 | 2018 | 1 | 2018 |
| CIHEP Full Rate Production Decision CSCS | 1 | 2018 | 1 | 2018 |
| CIHEP Delivery Decision TSCM | 3 | 2018 | 3 | 2018 |
| CIHEP Delivery Decision CSCS | 3 | 2018 | 3 | 2018 |
| CIHEP IOC TSCM | 4 | 2018 | 4 | 2018 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys* | **Project (Number/Name)**<br>2272 / *Intel Command and Control (C2) Sys* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| IBR Procurement Decision (Initial ENTR Version 4) | 2 | 2016 | 2 | 2016 |
| IBR Procurement Decision (ENTR Version 4) | 4 | 2017 | 4 | 2017 |
| IBR Delivery Decision (ENTR Version 4) | 1 | 2019 | 1 | 2019 |
| IBR Initial Operational Capability (IOC) (ENTR Version 4) | 2 | 2020 | 2 | 2020 |
| IBR Delivery Decision Final Operational Capability (FOC) (ENTR Version 4) | 2 | 2022 | 2 | 2022 |
| G-BOSS Tech Refresh Development & Interoperablilty | 2 | 2018 | 3 | 2019 |
| TSCS Procurement Decision (Legacy SOI) | 4 | 2017 | 4 | 2017 |
| TSCS Procurement Decision (SPRC) | 3 | 2017 | 3 | 2017 |
| TSCS Delivery Decision (Legacy SOI) | 4 | 2018 | 4 | 2018 |
| TSCS Delivery Decision (Server Sleeve) | 2 | 2018 | 2 | 2018 |
| TSCS Delivery Decision (SPRC) | 3 | 2018 | 3 | 2018 |
| JWICS Procurement Decision | 3 | 2018 | 3 | 2018 |
| JWICS Fielding Decision | 3 | 2018 | 3 | 2018 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0206629M *I (U)Amphibious Assault Vehicle* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 87.940 | 41.363 | 38.020 | 58.728 | - | 58.728 | 26.810 | 14.223 | 6.365 | 6.741 | Continuing | Continuing |
| 2938: *Amphibious Assault Vehicle* | 87.940 | 41.363 | 38.020 | 58.728 | - | 58.728 | 26.810 | 14.223 | 6.365 | 6.741 | Continuing | Continuing |

**Note**

NOTE: Prior funding is reflected in P.E. 0206623M/Project 0021.

**A. Mission Description and Budget Item Justification**

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 45.110 | 38.020 | 58.303 | - | 58.303 |
| Current President's Budget | 41.363 | 38.020 | 58.728 | - | 58.728 |
| Total Adjustments | -3.747 | 0.000 | 0.425 | - | 0.425 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -2.967 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.780 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.425 | - | 0.425 |

**Change Summary Explanation**

The increase from FY17 to FY18 ($20.708M) represents the start of AAV's Survivability Upgrade Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT). The increase also reflects the procurement of 3 C-variant Engineering, Manufacturing and Development (EMD) vehicles.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | Project (Number/Name)<br>2938 / *Amphibious Assault Vehicle* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2938: *Amphibious Assault Vehicle* | 87.940 | 41.363 | 38.020 | 58.728 | - | 58.728 | 26.810 | 14.223 | 6.365 | 6.741 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | 4 | 3 | - | 3 | - | - | - | - | | |

**Note**

The increase from FY17 to FY18 ($20.708M) represents the start of AAV's Survivability Upgrade Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT). The increase also reflects the procurement of 3 C-variant Engineering, Manufacturing and Development (EMD) vehicles.

**A. Mission Description and Budget Item Justification**

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 22.981 | 24.273 | 29.341 | 0.000 | 29.341 |
| ***Articles:*** | - | 4 | 3 | - | 3 |
| ***Description:*** AAV Survivability Upgrade will improve the legacy AAV Force Protection capability. Improvements include improved underbelly protection, integrated blast mitigating seats, integrated spall liners, protected fuel storage, sponson armor, and selected improvements to maintain required water and land mobility. AAV modifications will provide Nonrecurring Engineering (NRE) and design for AAV safety, obsolescence, and performance improvement engineering change proposals.<br><br>The increase from FY17 to FY18 of $5.068M is due to development activities for R7 Modernization, Survivability Upgrade Hydraulic Moderation and continued electrical modernization for legacy AAV's and for the addition of C-variant requirements, which include the procurement of 2 Engineering and Manufacturing Development (EMD) vehicles (C-variants) and 1 Live Fire Test & Evaluation vehicle (C-variant).<br><br>***FY 2016 Accomplishments:***<br>-Initiated prime contractor support for Developmental, Operational, and Live Fire Test and Evaluation (LFT&E). | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiated nonrecurring engineering effort for 3D Modeling for C-Variant.<br>-Initiated Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.<br>***FY 2017 Plans:***<br>-Complete prime contractor support for Developmental, Operational, and Live Fire Test and Evaluation (LFT&E).<br>-Initiate the procurement of four P-variant test articles for Full-Up System Level (FUSL) testing.<br>-Initiate the Corrective Action Period (CAP) for EMD.<br>-Initiate nonrecurring efforts for Electrical Modernization for development design, integration and test.<br>-Continue Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.<br>***FY 2018 Base Plans:***<br>-Continue nonrecurring efforts for legacy vehicle Electrical Modernization for design, development, integration, and test.<br>-Initiate prime contractor IOT&E and FUSL test support.<br>-Initiate the procurement of two (2) EMD vehicles (C-variant) vehicles and one (1) Live Fire Test & Evaluation (LFT&E) vehicle (C-variant).<br>-Initiate efforts in Hydraulic Modernization and R7 improvements for Survivability Upgrade.<br>-Complete Amphibious Remote Weapon Station (ARWS) integration and engineering analyses.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support | 5.163 | 4.652 | 3.666 | 0.000 | 3.666 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Provide government engineering and technical support for AAV safety, obsolescence, and performance modifications, and Survivability Upgrade support.<br>***FY 2016 Accomplishments:***<br>- Continued nonrecurring engineering and design for AAV electrical modernization, and command and control (C2) systems modernization.<br>- Continued to provide technical and engineering services in support of AAV obsolescence and performance modifications.<br>- Initiated nonrecurring engineering and design for AAV hydraulic modernization and hydrodynamics. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Continued to provide material and travel associated with these efforts.<br>***FY 2017 Plans:***<br>- Continue electrical modernization, and command and control (C2) systems modernization.<br>- Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications.<br>- Continue to provide material and travel associated with these efforts.<br>***FY 2018 Base Plans:***<br>- Continue electrical modernization, and command and control (C2) systems modernization.<br>- Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications.<br>- Continue to provide material and travel associated with these efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation | 6.902 | 5.059 | 21.240 | 0.000 | 21.240 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Developmental, Operational and Live Fire Test and Evaluation of safety improvements, upgrades, modifications and fact of life changes to ensure operational suitability and effectiveness of the AAV family of vehicles.<br><br>The increase from FY17 to FY18 of $16.181M reflects the initiation of Full-Up System Level (FUSL) testing, Initial Operational Test and Evaluation (IOT&E), and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).<br><br>***FY 2016 Accomplishments:***<br>-Initiated Developmental Testing for Survivability Upgrade and initiated Operational Assessment and Live Fire Test and Evaluation activities in support of Survivability Upgrade.<br>-Completed EAAK Phase III and E3 Co-site testing.<br>***FY 2017 Plans:***<br>- Continue Developmental Testing and Live Fire Test and Evaluation activities in support of Survivability Upgrade. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate hot and cold environmental testing for the Survivability Upgrade.<br>***FY 2018 Base Plans:***<br>- Continue Developmental Testing and Live Fire Test and Evaluation activities in support of Survivability Upgrade.<br>- Initiate Full-Up System Level (FUSL) testing for Survivability Upgrade.<br>- Initiate government labor associated with the Initial Operational Test and Evaluation (IOT&E) in support of the Survivability Upgrade.<br>- Initiate Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).<br>- Initiate Amphibious Remote Weapon Station (ARWS) Developmental Testing and Operational Testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Management and Engineering Technical Services<br>***Articles:***<br>***Description:*** Management support services and technical support for program office and field activities.<br>***FY 2016 Accomplishments:***<br>- Continued program management services in support of Engineering Change Proposal (ECP) development, trade studies and analysis, supply chain and government property management in support of AAV sustainment modification efforts.<br>- Completed program management services in support of AAV Survivability Upgrade.<br>***FY 2017 Plans:***<br>- Continue program management services in support of Engineering Change Proposals (ECP) development, trade studies and analysis, supply chain and government property management in support of AAV sustainment modification efforts.<br>***FY 2018 Base Plans:***<br>- Continue program management services in support of ECP development, trade studies and analysis, supply chain and<br>government property management in support of AAV sustainment modification efforts. | 6.317<br>- | 4.036<br>- | 4.481<br>- | 0.000<br>- | 4.481<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate non-recurring logistic support for systems integration.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 41.363 | 38.020 | 58.728 | 0.000 | 58.728 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/2021: *AAV Product Improvement Program* | 20.365 | 73.785 | 107.665 | - | 107.665 | 180.750 | 312.152 | 299.658 | 39.132 | 20.645 | 2,029.470 |

**Remarks**

**D. Acquisition Strategy**

The USMC competitively awarded two contracts in FY14 for development efforts in support of upgrading 392 Personnel-variant (P-Variant) Assault Amphibious Vehicles. Down-select to one contractor for manufacture of prototype vehicles occurred in February 2015. Subsequently, the requirement was increased to upgrading 405 Assault Amphibious Vehicles including the Command-Variant (C-Variant). The program's main focus is on improving Marine force protection capabilities. To support the required capabilities, the Survivability Upgrade program will seek to incorporate Non-Developmental Items (NDI) and/or Commercial off the Shelf (COTS) solutions into the existing P-Variant and C-Variant Reliability, Availability, Maintainability/Rebuild to Standard (RAM/RS) configuration of AAV. The acquisition strategy seeks to minimize cost and schedule, and maximize value, technology readiness, and commonality, while ensuring the selected manufacturer meets the capability attributes established for the RAM/RS. RDT&E funded competitive designs and contract options for Engineering and Manufacturing Development(EMD). Initial Operational Capability (IOC) is scheduled for FY19.

**E. Performance Metrics**

Milestone Reviews:
Milestone C: 4th quarter of FY17

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | Project (Number/Name)<br>2938 / *Amphibious Assault Vehicle* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Syst Design & Dev / EMD | C/FFP | MCSC : Quantico, VA | 46.888 | 20.523 | May 2016 | 20.069 | Aug 2017 | 17.864 | Feb 2018 | - | | 17.864 | Continuing | Continuing | Continuing |
| Other Product Development | C/BA | Various : Various | 0.629 | 2.458 | Feb 2016 | 4.204 | Mar 2017 | 11.476 | Mar 2018 | - | | 11.476 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 47.517 | 22.981 | | 24.273 | | 29.340 | | - | | 29.340 | - | - | - |

**Remarks**

The decrease from FY17 to FY18 for System Design & Development/EMD is due to completion of the Electrical Modernization for Survivability Upgrade. The increase from FY17 to FY18 in Other Product Development is due to development activities for R7 Modernization, Survivability Upgrade Hydraulic Moderation and continued electrical modernization for legacy AAV's and for the addition of C-variant requirements, which include the procurement of 2 Engineering and Manufacturing Development (EMD) vehicles (C-variants) and 1 Live Fire Test & Evaluation vehicle (C-variant).

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | Various | Various : Various | 0.197 | 0.296 | Oct 2015 | 0.256 | Oct 2016 | 0.249 | Oct 2017 | - | | 0.249 | Continuing | Continuing | Continuing |
| In-House Technical Support | Various | Various : Various | 19.822 | 4.867 | Feb 2016 | 4.396 | Feb 2017 | 3.418 | Feb 2018 | - | | 3.418 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 20.019 | 5.163 | | 4.652 | | 3.667 | | - | | 3.667 | - | - | - |

**Remarks**

The decrease from FY17 to FY18 in In-House Technical Support reflects less engineering and technical support due to the completion of SVR Design Assessments and preparation activities for Full-Up System Level (FUSL) test vehicles for Survivability Upgrade.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Testing (DT) | Various | Various : Various | 1.291 | 3.929 | Feb 2016 | 2.434 | Nov 2016 | 10.793 | Feb 2018 | - | | 10.793 | Continuing | Continuing | Continuing |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operational Testing (OT) | WR | MCOTEA : Quantico, VA | 0.182 | 0.840 | May 2016 | 0.000 | | 7.965 | Mar 2018 | - | | 7.965 | Continuing | Continuing | Continuing |
| Live Fire Test and Evaluation (LFT&E) | Various | Various : Various | 0.010 | 2.133 | Dec 2015 | 2.625 | Mar 2017 | 2.482 | Mar 2018 | - | | 2.482 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 1.483 | 6.902 | | 5.059 | | 21.240 | | - | | 21.240 | - | - | - |

**Remarks**

The increase from FY17 to FY18 for Testing reflects the initiation of Full-Up System Level (FUSL) testing, Initial Operational Test and Evaluation (IOT&E), and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT).

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Support Svcs | C/FFP | MCSC : Quantico, VA | 6.802 | 0.000 | Apr 2016 | 1.466 | Apr 2017 | 1.826 | Apr 2018 | - | | 1.826 | Continuing | Continuing | Continuing |
| Engineering and Technical Services | Various | Various : Various | 12.119 | 6.317 | Mar 2016 | 2.570 | Mar 2017 | 2.655 | Mar 2018 | - | | 2.655 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 18.921 | 6.317 | | 4.036 | | 4.481 | | - | | 4.481 | - | - | - |

**Remarks**

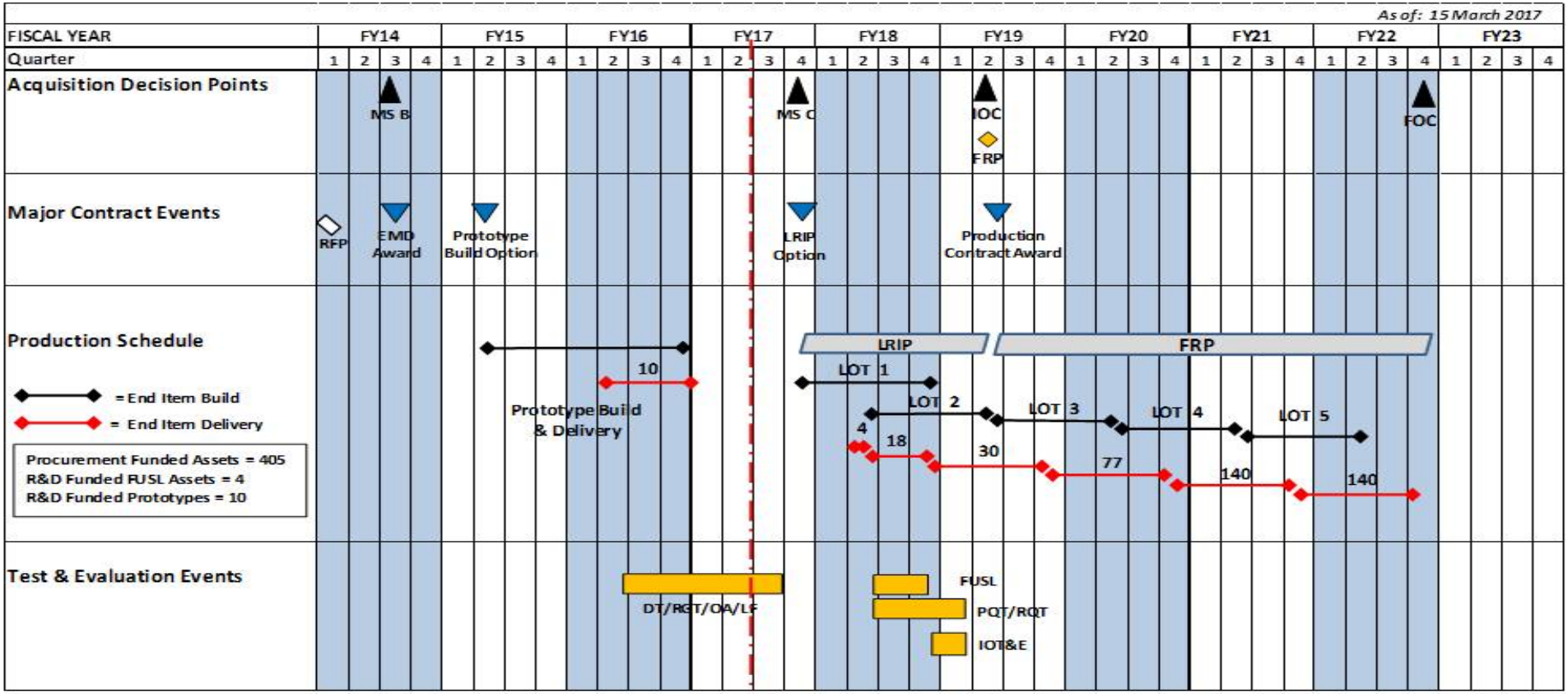
The increase from FY17 to FY18 reflects additional program management support for nonrecurring test and evaluation and logistic support for systems integration.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 87.940 | 41.363 | | 38.020 | | 58.728 | | - | | 58.728 | - | - | - |

**Remarks**

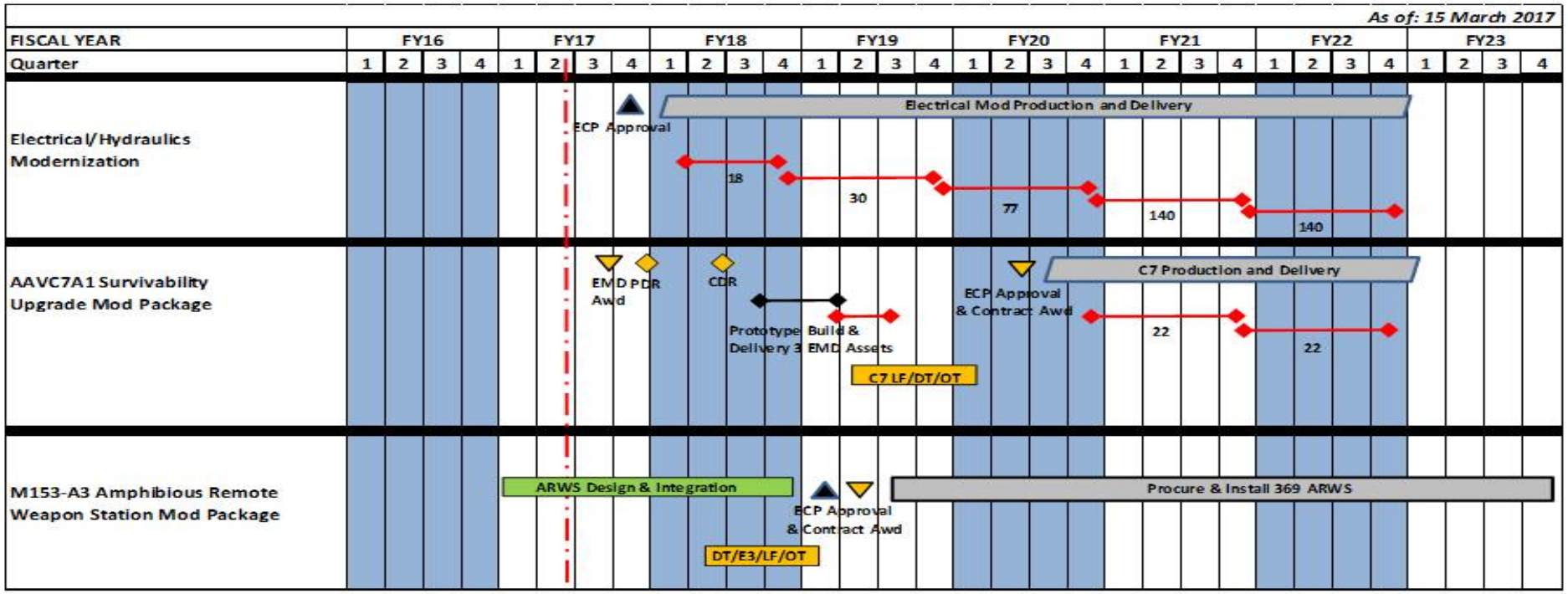
| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

## AAV SURVIVABILITY UPGRADE



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

## AAV MOD



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0206629M / *(U)Amphibious Assault Vehicle* | **Project (Number/Name)**<br>2938 / *Amphibious Assault Vehicle* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2938*** | | | | |
| Developmental Test and Evaluation/Production Qualification Testing/Reliability Testing (PQT/RQT) | 2 | 2016 | 1 | 2019 |
| MS C | 4 | 2017 | 4 | 2017 |
| LRIP Option Award | 4 | 2017 | 4 | 2017 |
| LRIP | 4 | 2017 | 2 | 2019 |
| Full-Up System Level Testing (FUSL) | 2 | 2018 | 4 | 2018 |
| IOT&E | 4 | 2018 | 1 | 2019 |
| Full Rate Production | 2 | 2019 | 4 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0207161N / *Tactical Aim Missiles* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 387.020 | 59.053 | 56.285 | 42.884 | - | 42.884 | 33.458 | 0.513 | 0.539 | 0.554 | 0.000 | 580.306 |
| 0457: *AIM-9X* | 387.020 | 59.053 | 56.285 | 42.884 | - | 42.884 | 33.458 | 0.513 | 0.539 | 0.554 | 0.000 | 580.306 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 442 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The AIM-9X (Sidewinder) short-range air-to-air missile is a long term evolution of the AIM-9 series of fielded missiles. The AIM-9X missile program provides a launch and leave, air combat munition that uses passive infrared (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the short-range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X employs several components common with the AIM-9M (fuze, rocket motor and warhead). Anti-Tamper features have been incorporated to protect improvements inherent in this design. AIM-9X is a Post Milestone C, Acquisition Category IC joint service program with Navy lead.

The Block II program has completed independent operational testing and found to be operationally effective and suitable. The program achieved Navy Initial Operational Capability (IOC) in March 2015 and received Full Rate Production decision in August 2015. The first Full Rate Production Lot contract was awarded in September 2015. This budget line will continue technical refresh of critical obsolete components, implement cost reduction initiatives, improve insensitive munitions performance, correct deficiencies, and increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Navy aircraft.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 71.016 | 56.285 | 36.569 | - | 36.569 |
| Current President's Budget | 59.053 | 56.285 | 42.884 | - | 42.884 |
| Total Adjustments | -11.963 | 0.000 | 6.315 | - | 6.315 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -10.193 | 0.000 | | | |
| • SBIR/STTR Transfer | -1.769 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 6.170 | - | 6.170 |
| • Rate/Misc Adjustments | -0.001 | 0.000 | 0.145 | - | 0.145 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0207161N *I Tactical Aim Missiles* |

**Change Summary Explanation**

Schedule:

1. The System Improvement Program (SIP) II contract has been extended 19 months to complete F-22 specific software deficiency identified during F-22 increment 3.2b Development Testing.
2. SIP III Missile software version 9.4 Integration Testing (IT-D1) has been extended 6 months to verify technical requirements, and performance thresholds of the performance specification, to verify the AIM-9X Block II missile system is ready for Follow-On Operational Test and Evaluation (FOT&E, OT-D1).
3. Operation Testing OT-D1 start date as well as Operational Test Readiness Review (OTRR) has been extended 6 months to the end of IT-D1 to share results with DT and minimize program cost.
4. The Lot 17 Hardware Engineering Change Proposal (ECP) cut-in date has been extended 6 months due to AIM-9X Block II+ productionization issues discovered during production qualification.
5. The planned hardware release has been moved from Lot 19 (FY 2019) to Lot 20 (FY 2020) due to hardware development issues experienced during development of replacement components. This is primarily due to diminishing manufacturing resources.
6. The SIP III hardware Preliminary Design Review (PDR) has has been extended 6 months to allow for additional time to redesign the guidance unit processor.
7. The SIP III hardware Critical Design Review (CDR) has been extended 18 months due to allow for additional time to redesign the guidance unit processor.

Cost:

FY 2018 original funding profile for SIP III included tasks that were planned to have been completed in FY 2017. However, the final SIP III contract award revised the weapon system development schedule leading to a rephasing of taskings and funds from FY 2016 into FY 2018.

FY 2016 includes $22.0M set aside pending final disposition of the proposed Congressional rescission. The five-year SIP III development contract price was negotiated down as a result of removing the Control Actuation System component redesign from the final contract. The Control Actuation System redesign effort has been moved into a planned AIM-9X future development increment outside the Future Years Defense Plan.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207161N / *Tactical Aim Missiles* | Project (Number/Name)<br>0457 / *AIM-9X* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0457: *AIM-9X* | 387.020 | 59.053 | 56.285 | 42.884 | - | 42.884 | 33.458 | 0.513 | 0.539 | 0.554 | 0.000 | 580.306 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 442

**A. Mission Description and Budget Item Justification**

AIM-9X is a long-term evolution of the AIM-9, a fielded system, qualifying this as a research category operational systems development. The AIM-9X short range air-to-air missile modification program provides a launch and leave, air combat munition that uses passive Infra-Red (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the short range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X employs several components common with the AIM-9M (fuze, rocket motor and warhead). The AIM-9X Block II missile is critical to project power and win decisively in accordance with the Fiscal Year 2015 Defense Planning Guidance and Navy's Navigation Plan 2015 - 2019. The missile is essential to Pacific Command plans to counter threats employed by advanced Digital Radio Frequency Memory (DRFM) electronic attack, cruise missiles, and Unmanned Aerial Vehicles.

This line item continues Technical Refresh of components and software, as well as incorporates advanced development products and capabilities, to meet threshold requirements of the capabilities production document. Specifically, the program will redesign, develop and integrate components facing obsolescence, implement cost reduction initiatives, enhance insensitive munitions performance and incrementally improve operational flight software to fully utilize capabilities of the missile.

The program strategy is to first redesign the control actuation system (CAS) battery, along with the AIM-9X Block II Plus (AIM-9X-3) and incorporate it into the Lot 17 (FY 2017) production missile. Next, the program will complete missile software improvements (software version 9.4) and release it into Lot 18 (FY 2018) and prior missiles. The software will provide improved infrared counter-countermeasures, correct partial degraded cueing, improved lock on after launch capability, improve small target acquisition, and provide surface attack capability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 52.932 | 48.870 | 31.641 | 0.000 | 31.641 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech Refresh) efforts for the AIM-9X weapon system. This includes Systems Engineering / Program management, as well as support required, to ensure AIM-9X missile integration with threshold US Navy aircraft platforms. This also includes efforts to redesign missile components in order to resolve Block II component obsolescence to ensure missile producibility beyond Lot 20, implement cost reduction initiatives, and to comply with the Insensitive Munitions (IM) requirements as established by Joint Requirements Oversight Council memo dated 11 February 2009. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Completed v9.315 software release to fleet. Completed Preliminary Design Review (PDR) and Critical Design Review (CDR) necessary to incorporate the CAS battery and Block II+ material design changes into the missile. Continued Engineering Manufacturing Development required to redesign, integrate, test, and qualify components due to obsolescence and implement cost reduction initiatives. Continued to develop v9.4 Block II software improvements to utilize full capability of the missile. Continued to develop missile hardware design improvements necessary to enhance IM performance.<br>***FY 2017 Plans:***<br>Incorporate CAS battery and Block II+ material design changes into production. Complete v9.316 software release to resolve F-22 aircraft deficiencies discovered during Block II operational testing. Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Continue to develop missile hardware design improvements necessary to enhance IM performance.<br>***FY 2018 Base Plans:***<br>Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Continue to develop missile hardware design improvements necessary to enhance IM performance. Complete CDR necessary to incorporate IMU, dome and processor redesigns into Lot 20 production.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation Activities and Support | 5.855 | 7.196 | 11.036 | 0.000 | 11.036 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with threshold US Navy aircraft platforms (F/A-18A+/C/D/E/F). Beginning in FY 2016 the program joined in with the US Air Force efforts in testing the next tech refresh version of software improvements to the missile, Operation Flight Software version 9.4. | | | | | |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Began Developmental Testing (DT-D1) of Operational Flight Software version 9.4 including improvements associated with integrating the F/A-18 aircraft to utilize full capability of the Block II missile.<br>***FY 2017 Plans:***<br>Complete Developmental Testing (DT-D1) and begin Developmental Testing and Integrated Testing (DT/IT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize full capability of the Block II missile.<br>***FY 2018 Base Plans:***<br>Complete Developmental Testing and Integrated Testing (DT/IT-D1) and Operational Test Readiness Review (OTRR), then begin Operational Testing (OT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize full capability of the Block II missile.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Management Services<br>***Articles:***<br>***Description:*** Transportation / Travel for AIM-9X efforts in supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above.<br>***FY 2016 Accomplishments:***<br>Continued funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above.<br>***FY 2017 Plans:***<br>Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above.<br>***FY 2018 Base Plans:***<br>Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above.<br>***FY 2018 OCO Plans:*** | 0.266<br>- | 0.219<br>- | 0.207<br>- | 0.000<br>- | 0.207<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 59.053 | 56.285 | 42.884 | 0.000 | 42.884 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN 2209: *Sidewinder* | 92.497 | 70.912 | 79.692 | - | 79.692 | 79.047 | 82.261 | 89.842 | 91.638 | 491.372 | 1,779.054 |
| • MPAF 3479: *Sidewinder* | 198.247 | 127.438 | 125.350 | - | 125.350 | 122.340 | 125.299 | 168.454 | 120.586 | 114.957 | 2,043.889 |
| • RDTE, AF 41: *Sidewinder* | 33.615 | 52.898 | 34.952 | - | 34.952 | 24.711 | 13.367 | 13.598 | 13.877 | 0.000 | 516.711 |
| • MPA, C62001000: *IFPC Inc 2-I Block 1, Missile* | 0.000 | 0.000 | 57.742 | - | 57.742 | 157.406 | 144.740 | 100.400 | 14.600 | 0.000 | 474.888 |

**Remarks**

**D. Acquisition Strategy**

Milestone C decision for LRIP was held June 24, 2011. The program received USN Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) Approval in August 2015 followed by contract award for FRP-1 in September 2015. The program awarded the FRP-2 contract in July 2016, and will award the option for FRP-3 in March 2017. The program plans to award FRP-4 in February 2018.

**E. Performance Metrics**

AIM-9X Block II:

1. Completed AIM-9X Block II (AIM-9X-2) USN Initial Operational Capability (2Q FY 2015) and Full Rate Production Decision (4Q FY 2015).
2. Completed v9.315 software release to fleet (2Q FY 2016).
3. Complete v9.316 software release to resolve F-22 aircraft deficiencies found during Block II operational testing (2Q FY 2017).

AIM-9X Block II Tech Refresh:

1. Complete Lot 17 Cut In Engineering Change Proposal to incorporate redesigned control actuation system battery and Block II plus (AIM-9X-3) into production (3Q FY 2017).
2. Complete Preliminary Design Review (PDR) to incorporate Inertial Measurement Unit (IMU), dome and processor redesigns into Lot 20 production (2Q FY 2017).
3. Complete Development Testing (DT-D1) for software v9.4 improvements (4Q FY 2017).
4. Complete (DT/IT-D1)for software v9.4 improvements (4Q FY 2018).
5. Complete OTRR for software v9.4 improvements (4Q FY 2018).
6. Complete Critical Design Review (CDR) to incorporate Inertial Measurement Unit (IMU), dome and processor redesigns into Lot 20 production (4Q FY 2018).

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware & Software Development | SS/CPFF | Raytheon Missile Systems : Tucson, AZ | 43.351 | 42.063 | Mar 2016 | 42.368 | Feb 2017 | 26.022 | Feb 2018 | - | | 26.022 | 13.312 | 167.116 | 167.116 |
| Aircraft Integration - Contract | C/CPFF | NSMA : Arlington, VA | 0.000 | 2.224 | Sep 2016 | 2.833 | Mar 2017 | 0.432 | Mar 2018 | - | | 0.432 | 0.000 | 5.489 | 5.489 |
| Aircraft Integration - USG | WR | NAWCWD : China Lake, CA | 19.810 | 3.366 | Jan 2016 | 0.098 | Dec 2016 | 0.021 | Dec 2017 | - | | 0.021 | 0.000 | 23.295 | - |
| USG Systems Engineering & Project Managment Support | WR | NAWC AD : Patuxent River, MD | 0.255 | 0.591 | Dec 2015 | 0.556 | Dec 2016 | 0.709 | Dec 2017 | - | | 0.709 | 0.000 | 2.111 | - |
| USG Systems Engineering & Project Managment Support | WR | NAWCWD : China Lake, CA | 0.000 | 4.688 | Jan 2016 | 3.015 | Dec 2016 | 4.457 | Dec 2017 | - | | 4.457 | 6.101 | 18.261 | - |
| Prior Year Prod Dev cost no longer funded in the FYDP | Various | Various : Various | 260.249 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 260.249 | - |
| | | **Subtotal** | 323.665 | 52.932 | | 48.870 | | 31.641 | | - | | 31.641 | 19.413 | 476.521 | - |

**Remarks**

1. Total prior years - FY95 and prior under PE 0603715D.
2. FY 2018 original funding profile for SIP III included tasks that were planned to have been completed in FY 2017. However, the final SIP III contract award revised the weapon system development schedule leading to a rephasing of taskings and funds from FY 2016 into FY 2018.
3. The decrease in Aircraft Integration between FY 2017 to FY 2018 reflects completion of threshold platform software integration requirements with the AIM-9X Block II program.
4. The increase in USG Systems Engineering & Project Management from FY 2017 to FY 2018 reflects a USN government lab test support requirement to ensure tech refresh improvements are incorporated into the final hardware and software design at PAX, and conduct Insensitive Munitions Risk Reductions (IMRR) activities at China Lake.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Tech Support | C/CPIF | Navy System Mgmt Activity : Arlington, VA | 0.000 | 0.476 | Oct 2016 | 0.025 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.501 | 0.501 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207161N / *Tactical Aim Missiles* | Project (Number/Name)<br>0457 / *AIM-9X* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Support | C/CPFF | Wyle Lab Inc. : Huntsville, AL | 0.239 | 0.240 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.479 | 0.479 |
| Prior Year Support Costs | C/CPFF | Various : Various | 0.949 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.949 | 0.949 |
| | | **Subtotal** | 1.188 | 0.716 | | 0.025 | | 0.000 | | - | | 0.000 | 0.000 | 1.929 | 1.929 |

**Remarks**

Provides one-time engineering and management services in support of air to air weapons development, testing, and integration support.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oper Test & Eval | WR | COMOPTEVFOR : Norfolk, VA | 8.945 | 0.020 | Mar 2016 | 0.553 | Mar 2017 | 3.464 | Mar 2018 | - | | 3.464 | 5.044 | 18.026 | - |
| Development Testing | WR | NAWCWD : China Lake, CA | 1.433 | 5.119 | Jan 2016 | 6.618 | Dec 2016 | 7.572 | Dec 2017 | - | | 7.572 | 10.301 | 31.043 | - |
| Prior year T&E cost no longer funded in the FYDP | Various | Various : Various | 40.382 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 40.382 | - |
| | | **Subtotal** | 50.760 | 5.139 | | 7.171 | | 11.036 | | - | | 11.036 | 15.345 | 89.451 | - |

**Remarks**

Increase in Operational Test and Evaluation at COMOPTEVFOR reflects DT/IT-D1 efforts to incorporate software v9.4 into the missile. Development Test at China Lake reflects DT/IT-D1 efforts to test software v9.4 improvements in accordance with the test and evaluation master plan (TEMP) revision e.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transportation - Material | WR | NAVAIR : Patuxent River, MD | 0.402 | 0.101 | Oct 2015 | 0.075 | Oct 2016 | 0.075 | Oct 2017 | - | | 0.075 | 0.075 | 0.728 | - |
| Travel - Obligation throughout the year | WR | NAWCAD : Patuxent River, MD | 2.972 | 0.165 | Oct 2015 | 0.144 | Oct 2016 | 0.132 | Oct 2017 | - | | 0.132 | 0.231 | 3.644 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207161N / *Tactical Aim Missiles* | Project (Number/Name)<br>0457 / *AIM-9X* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Mgmt cost no longer funded in the FYDP | Various | Various : Various | 8.033 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.033 | - |
| | | **Subtotal** | 11.407 | 0.266 | | 0.219 | | 0.207 | | - | | 0.207 | 0.306 | 12.405 | - |

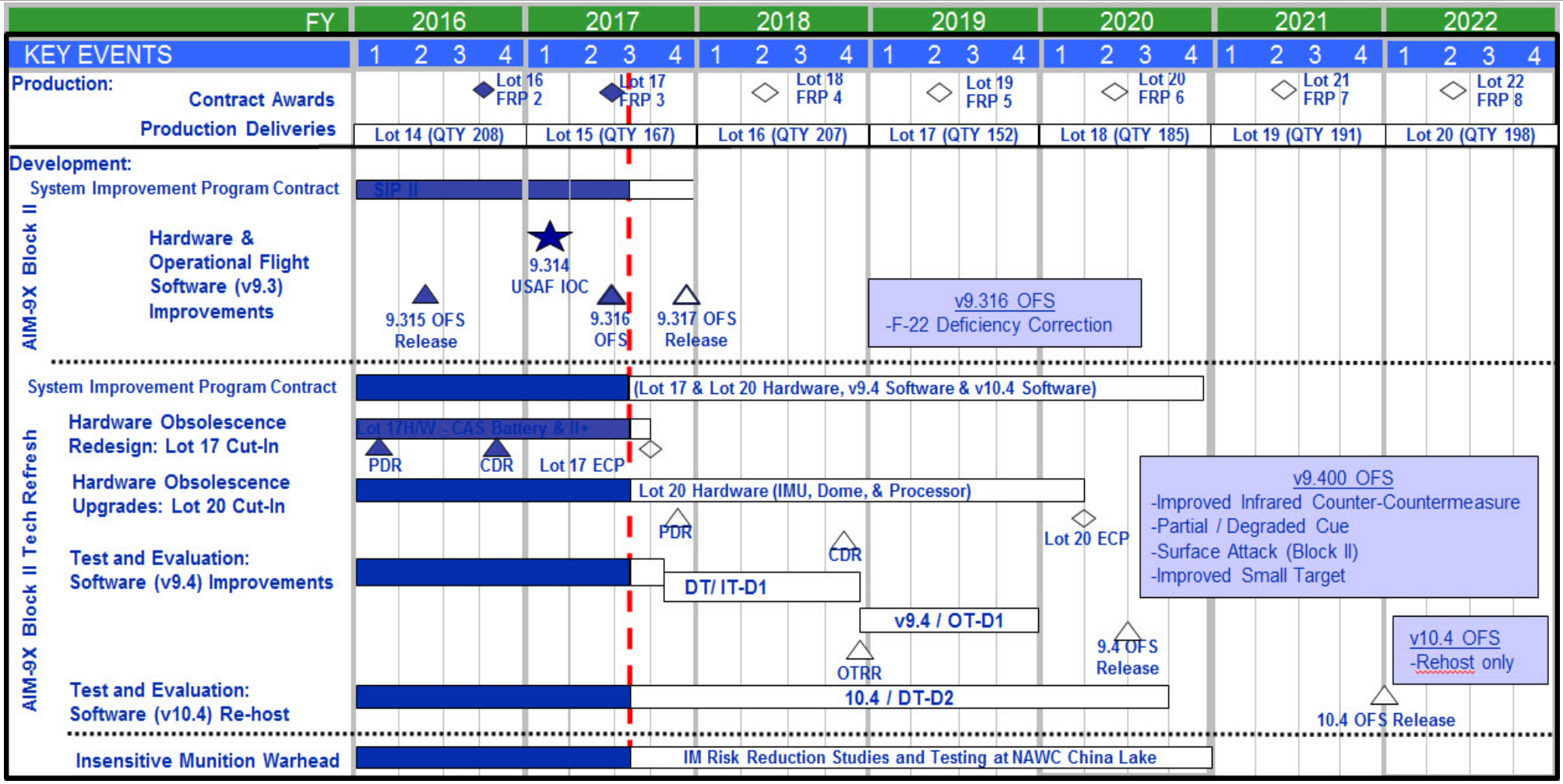
**Remarks**

Provides transportation of test assets, as well as travel of persons, in support of the AIM-9X Block II System Improvement Program (SIP) III project.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 387.020 | 59.053 | | 56.285 | | 42.884 | | - | | 42.884 | 35.064 | 580.306 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***TACTICAL AIM MISSILES*** | | | | |
| Production Milestones - Block II: Contract Awards: Lot 16 (FRP 2): QTY 207 | 4 | 2016 | 4 | 2016 |
| Production Milestones - Block II: Contract Awards: Lot 17 (FRP 3): QTY 152 | 2 | 2017 | 2 | 2017 |
| Production Milestones - Block II: Contract Awards: Lot 18 (FRP 4): QTY 185 | 2 | 2018 | 2 | 2018 |
| Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5): QTY 191 | 2 | 2019 | 2 | 2019 |
| Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6): QTY 198 | 2 | 2020 | 2 | 2020 |
| Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7): QTY 200 | 2 | 2021 | 2 | 2021 |
| Production Milestones - Block II: Contract Awards: Lot 22 (FRP 8): QTY 192 | 2 | 2022 | 2 | 2022 |
| Production Deliveries: Low Rate Initial Production 4 (WPN) QTY 208 | 4 | 2016 | 4 | 2016 |
| Production Deliveries: Lot 15 (FRP 1) QTY 167 | 4 | 2017 | 4 | 2017 |
| Production Deliveries: Lot 16 (FRP 2) QTY 207 | 4 | 2018 | 4 | 2018 |
| Production Deliveries: Lot 17 (FRP 3) QTY 152 | 4 | 2019 | 4 | 2019 |
| Production Deliveries: Lot 18 (FRP 4) QTY 185 | 4 | 2020 | 4 | 2020 |
| Production Deliveries: Lot 19 (FRP 5) QTY 191 | 4 | 2021 | 4 | 2021 |
| Production Deliveries: Lot 20 (FRP 6) QTY 198 | 4 | 2022 | 4 | 2022 |
| AIM-9X Block II: System Improvement Program Contract Award: System Improvement Program II Engineering Manufacturing Development Contract | 1 | 2016 | 4 | 2017 |
| AIM-9X Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability | 1 | 2017 | 1 | 2017 |
| AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.315 | 2 | 2016 | 2 | 2016 |
| AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.316 | 2 | 2017 | 2 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.317 | 4 | 2017 | 4 | 2017 |
| AIM-9X Block II Tech Refresh: Tech Refresh Development Contracts: System Improvement Program III Engineering Manufacturing Development Contract | 1 | 2016 | 4 | 2020 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware (CAS Battery & Block II+) | 1 | 2016 | 3 | 2017 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Preliminary Design Review | 1 | 2016 | 1 | 2016 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Critical Design Review | 3 | 2016 | 3 | 2016 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Engineering Change Proposal | 3 | 2017 | 3 | 2017 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (IMU, Dome & Processor) | 1 | 2016 | 1 | 2020 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Preliminary Design Review | 4 | 2017 | 4 | 2017 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review | 4 | 2018 | 4 | 2018 |
| AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Engineering Change Proposal | 1 | 2020 | 1 | 2020 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Testing | 1 | 2016 | 4 | 2017 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing | 4 | 2017 | 4 | 2018 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Test Readiness Review | 4 | 2018 | 4 | 2018 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Testing | 4 | 2018 | 4 | 2019 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Software v9.4 Release | 2 | 2020 | 2 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207161N / *Tactical Aim Missiles* | **Project (Number/Name)**<br>0457 / *AIM-9X* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing | 1 | 2016 | 3 | 2020 |
| AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Operational Flight Software Release | 1 | 2022 | 1 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0207163N *I AMRAAM* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 129.014 | 30.240 | 40.350 | 25.364 | - | 25.364 | 32.358 | 32.738 | 33.405 | 24.069 | 49.446 | 396.984 |
| 0981: *AMRAAM* | 129.014 | 30.240 | 40.350 | 25.364 | - | 25.364 | 32.358 | 32.738 | 33.405 | 24.069 | 49.446 | 396.984 |

**Program MDAP/MAIS Code:**
**Project MDAP/MAIS Code(s):** 185

## A. Mission Description and Budget Item Justification

This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the Advanced Medium Range Air-to-Air Missile (AMRAAM) into Navy aircraft with analysis of Navy unique applications, aircraft missile integration tasks, product improvement efforts including missile software upgrade development and procurement of hardware to support Navy test and evaluation tasks.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 32.172 | 40.350 | 46.349 | - | 46.349 |
| Current President's Budget | 30.240 | 40.350 | 25.364 | - | 25.364 |
| Total Adjustments | -1.932 | 0.000 | -20.985 | - | -20.985 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.975 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.957 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -21.000 | - | -21.000 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.015 | - | 0.015 |

**Change Summary Explanation**

FY 2018 includes funding for improved missile performance at longer range, increased survivability, improved lethality, and continues Advanced AIM-120C7 & AIM-120D Electronic Protection Improvement Program efforts through software development, simulation and test efforts.

Schedule - Test and Evaluation events have been added to the schedule.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0207163N *I AMRAAM* |

Technical - FY 2018 System Improvement Program (SIP) funding was reduced as a result of capability upgrades shifting to the out years to better align with AMRAAM production.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207163N / *AMRAAM* | Project (Number/Name)<br>0981 / *AMRAAM* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0981: *AMRAAM* | 129.014 | 30.240 | 40.350 | 25.364 | - | 25.364 | 32.358 | 32.738 | 33.405 | 24.069 | 49.446 | 396.984 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 185

**A. Mission Description and Budget Item Justification**

This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the Advanced Medium Range Air-to-Air Missile (AMRAAM) into Navy aircraft with analysis of Navy unique applications, aircraft missile integration tasks, product improvement efforts including missile software upgrade development and procurement of hardware to support Navy test and evaluation tasks. Funding in FY 2016 through FY 2022 supports Navy unique Test & Evaluation for Navy fielding of the AIM-120C7 and AIM-120D Electronic Protection Improvement Program (EPIP) capability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Test and Evaluation | 8.420 | 5.485 | 4.062 | 0.000 | 4.062 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Test and Evaluation (T&E) and associated governmental support required to ensure AIM-120 missile integration with threshold US Navy aircraft platforms (F/A-18 C/D/E/F and Joint Strike Fighter). | | | | | |
| ***FY 2016 Accomplishments:***<br>Completed AIM-120C7 EPIP Advanced Tape 1 DT, complete a DT/OT transition report and the AIM-120C7 EPIP Advanced Tape 1 Operational Test Readiness Review (OTRR). Fielded the AIM-120C3 through 6 EPIP Basic capability. Continued building test infrastructure to support SIP-1 test events and large force exercises. Provided test resources and test assets for EPIP Advanced Tape 2 DT. Completed AIM-120D SIP-1 IT/OT test events, supplied inputs to the OT test report and generated the fielding decision for SIP-1 on F/A-18 aircraft. | | | | | |
| ***FY 2017 Plans:***<br>Continue to provide test asset and support for AIM-120D SIP-2, AIM-120C7 EPIP Advanced Tape 1 and 2 activities. Provide test and evaluation inputs to the EPIP Advanced Tape 2 and SIP-2 designs and support the respective Critical Design Reviews. Provide necessary documentation and provide test results for SIP-2 DT and EPIP Advanced Tape 2 test events. Conduct OTRR for SIP-2 and EPIP Advanced Tape 2. Certify and field EPIP Advanced Tape 1 on F/A-18. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete EPIP Advanced Tape 2 test events, supply inputs to OT test report and generate the fielding decision for EPIP Advanced Tape 2 fielding decision for F/A-18 aircraft. Complete AIM-120D SIP-2 IT/OT test events, supply inputs to the OT test report and generate the fielding decision for SIP-2 on F/A-18 aircraft in 1QFY 2019. Provide test and evaluation inputs to SIP-3 design and support Critical Design Review. Provide necessary documentation and provide test results for SIP-3 DT events.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Identify potential improvements<br>***Articles:***<br>***Description:*** Engineering support of AMRAAM, including investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems.<br>***FY 2016 Accomplishments:***<br>Continued engineering support of AMRAAM, to include investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems.<br>***FY 2017 Plans:***<br>Continue engineering support of AMRAAM, to include investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems.<br>***FY 2018 Base Plans:***<br>Continue engineering support of AMRAAM, to include investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems.<br>***FY 2018 OCO Plans:***<br>N/A | 0.456<br>- | 0.227<br>- | 0.230<br>- | 0.000<br>- | 0.230<br>- |
| ***Title:*** System Improvement Program (SIP) Efforts<br>***Articles:***<br>***Description:*** Continuation of System Improvement Program (SIP)/Technical Maturity and Risk Reduction (TMRR) efforts for the AMRAAM weapon system. These include systems engineering, program management, missile software and/or hardware upgrades to increase capability, survivability, lethality, as well as aircraft Operational Flight Profile updates on a recurring basis. EPIP Advanced Tape 1 and Tape 2 capability improvements on the C7 missile variant will be incorporated with AIM-120D SIP-2 and 3 software updates. | 21.364<br>- | 34.638<br>- | 21.072<br>- | 0.000<br>- | 21.072<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Continued infrastructure investments to support AIM-120D SIP-1, 2, 3 and AIM-120C EPIP activities. Developed an AMRAAM Data Recorder (ADR) to replace the Inflight Data Acquisition Pod (IDAP), which has become unreliable and obsolete, along with additional test equipment to meet SIP-2 and SIP-3 requirements. Completed SIP-1 OT and deployed the first AIM-120D improvement software increment to the Navy AMRAAM inventory. Continued SIP-2 EMD acquisition activities and conducted a critical design review. Awarded SIP-3 TMRR and began EMD contracting efforts.<br>***FY 2017 Plans:***<br>Complete EPIP Advanced Tape 1 OT events and field in the C7 missile variant. Complete AIM-120C7 EPIP Advanced Tape 2 DT efforts and enter into OT. Continue AIM-120D SIP-2 EMD DT flight testing and conduct Functional Configuration Audit/Test Readiness Board and OTRR. Award SIP-3 EMD contract.<br>***FY 2018 Base Plans:***<br>Complete SIP-2 OT events required for 1QFY 2019 fielding decision for the AIM-120D software improvement. Complete AIM-120C7 EPIP Advanced Tape 2 OT efforts and field Tape 2 in the AIM-120C7 variant. Continue AIM-120D SIP-3 design and conduct Critical Design Review.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 30.240 | 40.350 | 25.364 | 0.000 | 25.364 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN/ 2206: *AMRAAM* | 202.773 | 204.697 | 197.109 | - | 197.109 | 284.679 | 288.445 | 299.484 | 302.831 | 644.555 | 4,565.796 |
| • MPAF/3479: *AMRAAM* | 362.028 | 350.144 | 303.720 | - | 303.720 | 470.016 | 430.962 | 468.452 | 443.452 | 942.460 | 12,483.219 |
| • RDTE,AF/673777: *AMRAAM* | 46.160 | 61.044 | 61.612 | - | 61.612 | 65.733 | 66.910 | 68.115 | 68.830 | 43.000 | 943.488 |

**Remarks**

**D. Acquisition Strategy**

AMRAAM production procurements will continue across the FYDP with periodic pre-planned technical design refreshes and value engineering change proposals. The Air Dominance Division has implemented a multiple year production contract strategy (basic contract with 2 priced options).

AMRAAM's Acquisition Program Baseline (APB) was updated on 28 Oct 2015.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

**E. Performance Metrics**

Meeting cost, schedule, performance, funding and life cycle sustainment requirements in accordance with the Acquisition Program Baseline.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207163N / *AMRAAM* | Project (Number/Name)<br>0981 / *AMRAAM* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hdw Development (EGLIN) | SS/CPAF | RAYTHEON COMPANY : Tucson AZ | 46.164 | 15.083 | Jan 2016 | 29.001 | Jan 2017 | 17.462 | Jan 2018 | - | | 17.462 | 119.691 | 227.401 | 227.401 |
| Award Fees (EGLIN) | SS/CPAF | RAYTHEON COMPANY : Tucson AZ | 6.650 | 2.662 | Jan 2016 | 5.123 | Jan 2017 | 3.082 | Jan 2018 | - | | 3.082 | 21.122 | 38.639 | 38.639 |
| Primary Hdw Development (NAWCAD) | WR | NAWCAD : Patuxent River MD | 3.042 | 0.535 | Nov 2015 | 0.437 | Nov 2016 | 0.460 | Nov 2017 | - | | 0.460 | 2.813 | 7.287 | - |
| Primary Hdw Development (NAWCWD) | WR | NAWCWD : China Lake CA | 1.081 | 0.585 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.666 | - |
| Primary Hardware Development (NSMA) | C/FFP | NAVY SYST MGT ACT : Arlington VA | 0.000 | 2.416 | May 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.416 | - |
| Prior Years Dev Cost no longer funded in the FYDP | Various | Various : Various | 22.839 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 22.839 | - |
| | | **Subtotal** | 79.776 | 21.281 | | 34.561 | | 21.004 | | - | | 21.004 | 143.626 | 300.248 | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support (NSMA) | WR | NAVY SYST MGT ACT : Arlington VA | 3.817 | 0.456 | Jan 2016 | 0.227 | Jan 2017 | 0.230 | Jan 2018 | - | | 0.230 | 1.475 | 6.205 | - |
| Prior Years Support costs no longer funded in the FYDP | Various | Various : Various | 19.295 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 19.295 | - |
| | | **Subtotal** | 23.112 | 0.456 | | 0.227 | | 0.230 | | - | | 0.230 | 1.475 | 25.500 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dev Test & Eval (NAWCWD) | WR | NAWCWD : China Lake CA | 18.884 | 7.825 | Feb 2016 | 5.485 | Nov 2016 | 3.452 | Nov 2017 | - | | 3.452 | 22.607 | 58.253 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0207163N / *AMRAAM* | Project (Number/Name)<br>0981 / *AMRAAM* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oper Test & Eval | WR | COMOPTEVFOR : Norfolk, VA | 0.000 | 0.595 | Jul 2016 | 0.000 | | 0.610 | Mar 2018 | - | | 0.610 | 3.911 | 5.116 | - |
| | | **Subtotal** | 18.884 | 8.420 | | 5.485 | | 4.062 | | - | | 4.062 | 26.518 | 63.369 | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | MIPR | PMA-259 : Eglin AFB FL | 3.240 | 0.083 | Oct 2015 | 0.077 | Oct 2016 | 0.068 | Oct 2017 | - | | 0.068 | 0.398 | 3.866 | - |
| Prior Years Mgmt Costs no longer funded in the FYDP | Various | Various : Various | 4.002 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.002 | - |
| | | **Subtotal** | 7.242 | 0.083 | | 0.077 | | 0.068 | | - | | 0.068 | 0.398 | 7.868 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 129.014 | 30.240 | | 40.350 | | 25.364 | | - | | 25.364 | 172.017 | 396.985 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

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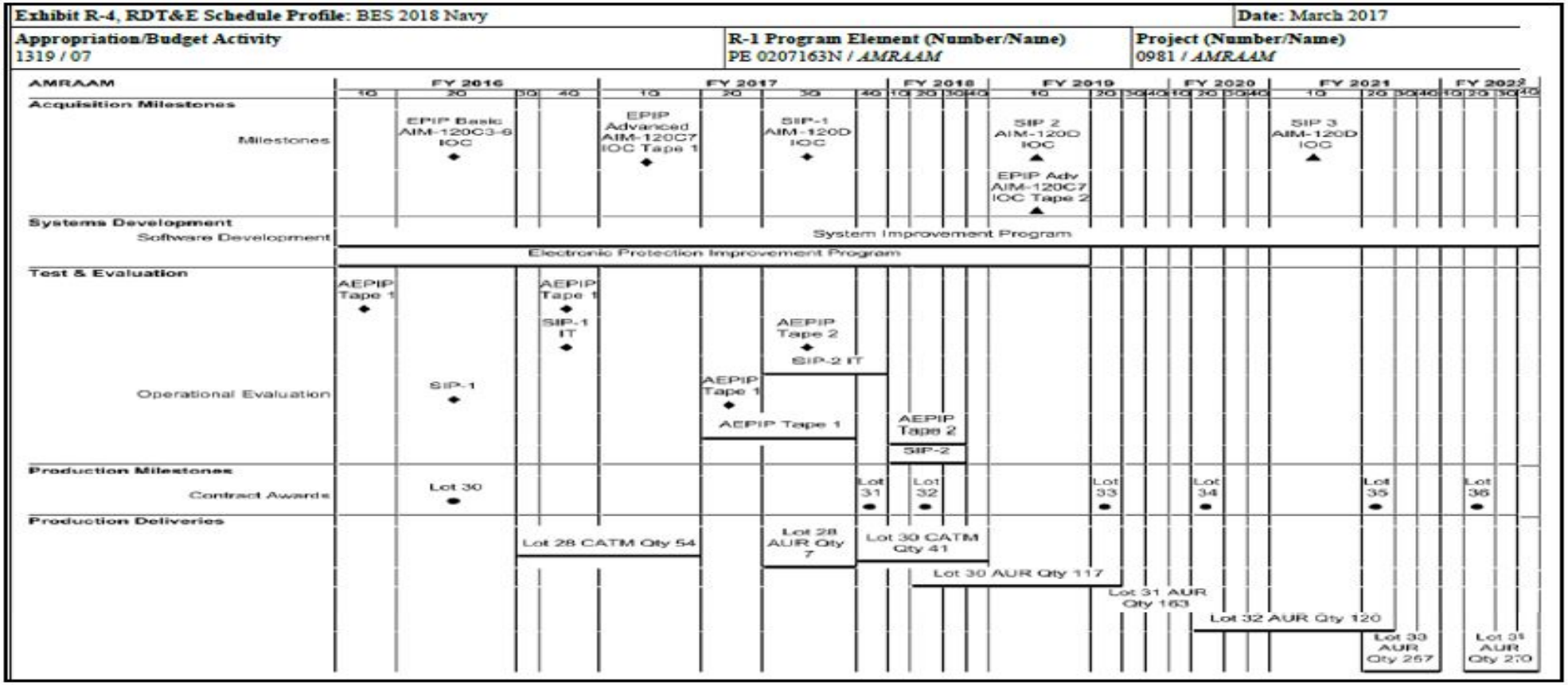

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***AMRAAM*** | | | | |
| Acquisition Milestones: Milestones: EPIP Basic AIM-120C3-6 IOC | 2 | 2016 | 2 | 2016 |
| Acquisition Milestones: Milestones: SIP-1 AIM-120D IOC | 3 | 2017 | 3 | 2017 |
| Acquisition Milestones: Milestones: EPIP Advanced AIM-120C7 IOC Tape 1 | 1 | 2017 | 1 | 2017 |
| Acquisition Milestones: Milestones: SIP 2 AIM-120D IOC | 1 | 2019 | 1 | 2019 |
| Acquisition Milestones: Milestones: SIP 3 AIM-120D IOC | 1 | 2021 | 1 | 2021 |
| Acquisition Milestones: Milestones: EPIP Advanced AIM-120C7 IOC Tape 2 | 1 | 2019 | 1 | 2019 |
| Systems Development: Software Development: System Improvement Program Start (P3I Follow-0n) | 1 | 2016 | 4 | 2022 |
| Systems Development: Software Development: Electronic Protection Improvement Program | 1 | 2016 | 1 | 2019 |
| Test & Evaluation: AEPIP Tape 1 IT-1/2 | 1 | 2016 | 1 | 2016 |
| Test & Evaluation: AEPIP Tape 1 IT- 3 | 4 | 2016 | 4 | 2016 |
| Test & Evaluation: SIP-1 IT-03 | 4 | 2016 | 4 | 2016 |
| Test & Evaluation: AEPIP Tape 2 IT-4/5 | 3 | 2017 | 3 | 2017 |
| Test & Evaluation: SIP-2 IT-1/2/3 | 3 | 2017 | 4 | 2017 |
| Test & Evaluation: Operational Evaluation: SIP-1 OT-1/2 | 2 | 2016 | 2 | 2016 |
| Test & Evaluation: Operational Evaluation: AEPIP Tape 1 OT-1 | 2 | 2017 | 2 | 2017 |
| Test & Evaluation: Operational Evaluation: AEPIP Tape 1 OT-2/3 | 2 | 2017 | 3 | 2017 |
| Test & Evaluation: Operational Evaluation: AEPIP Tape 2 OT-4/5/6 | 1 | 2018 | 3 | 2018 |
| Test & Evaluation: Operational Evaluation: SIP-2 OT-1/2/3/4 | 1 | 2018 | 3 | 2018 |
| Production Milestones: Contract Awards: Production Lot 30 Contract Award | 2 | 2016 | 2 | 2016 |
| Production Milestones: Contract Awards: Production Lot 31 Contract Award | 4 | 2017 | 4 | 2017 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0207163N / *AMRAAM* | **Project (Number/Name)**<br>0981 / *AMRAAM* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Production Milestones: Contract Awards: Production Lot 32 Contract Award | 2 | 2018 | 2 | 2018 |
| Production Milestones: Contract Awards: Production Lot 33 Contract Award | 2 | 2019 | 2 | 2019 |
| Production Milestones: Contract Awards: Production Lot 34 Contract Award | 2 | 2020 | 2 | 2020 |
| Production Milestones: Contract Awards: Production Lot 35 Contract Award | 2 | 2021 | 2 | 2021 |
| Production Milestones: Contract Awards: Production Lot 36 Contract Award | 2 | 2022 | 2 | 2022 |
| Production Deliveries: Production Lot 28 AUR Qty 7 | 3 | 2017 | 3 | 2017 |
| Production Deliveries: Production Lot 28 CATM Qty 54 | 3 | 2016 | 1 | 2017 |
| Production Deliveries: Production Lot 30 CATM Qty 41 | 4 | 2017 | 4 | 2018 |
| Production Deliveries: Production Lot 30 AUR Qty 117 | 2 | 2018 | 2 | 2019 |
| Production Deliveries: Production Lot 31 AUR Qty 163 | 2 | 2019 | 2 | 2020 |
| Production Deliveries: Production Lot 32 AUR Qty 120 | 2 | 2020 | 2 | 2021 |
| Production Deliveries: Production Lot 33 AUR Qty 257 | 2 | 2021 | 4 | 2021 |
| Production Deliveries: Production Lot 34 AUR Qty 270 | 2 | 2022 | 4 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0219902M *I Global Combat Support Systems - Marine Corps* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 0.000 | 0.000 | 9.128 | 0.000 | - | 0.000 | 2.695 | 0.000 | 0.000 | 0.000 | 0.000 | 11.823 |
| 5503: *Global Combat Support System - Marine Corps (GCSS-MC)* | 0.000 | 0.000 | 9.128 | 0.000 | - | 0.000 | 2.695 | 0.000 | 0.000 | 0.000 | 0.000 | 11.823 |

**A. Mission Description and Budget Item Justification**

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS, (GCSS-MC)/Logistics Chain Management (LCM) is the implementation of the enterprise Information Technology (IT) architecture designed to support both improved and enhanced Marine Air Ground Task Force (MAGTF) Combat Support Services (CSS) functions and MAGTF Commander and Combatant Commanders/Joint Task Force (CC/JTF) combat support information requirements. The primary goal of GCSS-MC/LCM is to provide the capabilities specified in the Logistics Operational Architecture (Log OA). The result of enabling the Log OA is the retirement of logistics applications. GCSS-MC/LCM exposes timely mission information to Marine Corps operational and CSS commanders, CC/JTF commanders and their staffs and other authorized users. It exposes information interoperability and common logistics information applications and services across functional areas. GCSS-MC/LCM is an enabler that allows operating forces commanders to base decisions on complete logistics information and make decisions in concert with specific operational tasks. Other follow-on functionalities can be invoked if affordable and when defined by the problem statements.
Funding in GCSS-MC/LCM RDT&E PE 0206313M/Project 2510 for Tactical - Warehouse Management System transitioned to PE 0219902M/Project 5503 commencing in FY17.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 9.128 | 4.453 | - | 4.453 |
| Current President's Budget | 0.000 | 9.128 | 0.000 | - | 0.000 |
| Total Adjustments | 0.000 | 0.000 | -4.453 | - | -4.453 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -4.476 | - | -4.476 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.023 | - | 0.023 |

**Change Summary Explanation**

The decrease from FY17 to FY18 is due to change in acquisition strategy and a re-phase of the capability.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0219902M / *Global Combat Support Systems - Marine Corps* | Project (Number/Name)<br>5503 / *Global Combat Support System - Marine Corps (GCSS-MC)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5503: *Global Combat Support System - Marine Corps (GCSS-MC)* | 0.000 | 0.000 | 9.128 | 0.000 | - | 0.000 | 2.695 | 0.000 | 0.000 | 0.000 | 0.000 | 11.823 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS (GCSS-MC)/Logistics Chain Management (LCM) is the physical implementation of the enterprise Information Technology (IT) architecture designed to support both improved and enhanced Marine Air Ground Task Force (MAGTF) Combat Support Services (CSS) functions and MAGTF Commander and Combatant Commanders/Joint Task Force (CC/JTF) combat support information requirements. The primary goal of GCSS-MC/LCM is to provide the capabilities specified in the Logistics Operational Architecture (LOG OA). The result of enabling the LOG OA is the retirement of logistics applications. The GCSS-MC/LCM exposes timely mission information to Marine Corps operational and CSS commanders, CC/JTF commanders and their staffs and other authorized users. It exposes information interoperability and common logistics information applications and services across functional areas. GCSS-MC/LCM is an enabler that allows operating forces commanders to base decisions on complete logistics information and make decisions in concert with specific operational tasks. Other follow-on capabilities can be invoked if affordable and when defined by the problem statements. Funding in GCSS-MC/LCM RDT&E PE 0206313M/Project 2510 for Tactical - Warehouse Management System transitioned to PE 0219902M/Project 5503 commencing in FY17.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Global Combat Support Systems - Marine Corps (GCSS-MC)/LCM Tactical - Warehouse Management System (Product Development, Support and Management Services) | 0.000 | 9.128 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The decrease from FY17 to FY18 is due to change in acquisition strategy and a re-phase of the capability. | | | | | |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Initiate the development of T-WMS which supports the implementation of Logistics Operational Architecture (LOG OA) processes for warehouse management at the Supply Management Units (SMUs), Repairable Issue Point (RIPs), Initial Issue Provisioning (IIP), Using Units (UU), and Marine Force Reserves (MARFORRES). Plans include preparation for a Request for Procurement (RPF) and program baseline. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0219902M / *Global Combat Support Systems - Marine Corps* | **Project (Number/Name)**<br>5503 / *Global Combat Support System - Marine Corps (GCSS-MC)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 9.128 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4616: *Global Combat Support System - Marines* | 0.000 | 1.089 | 1.990 | - | 1.990 | 9.594 | 9.205 | 1.230 | 1.256 | Continuing | Continuing |
| • RDT&E/0206313M: *Marine Corps Comms Systems* | 9.163 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 17.821 |

**Remarks**

**D. Acquisition Strategy**

PMW 230 strategy for GCSS-MC/LCM is to 'embrace and replace' existing logistics information systems. Using the capabilities provided by GCSS-MC/LCM Increment 1, PMW 230 (PM for GCSS-MC) will embrace existing logistics information systems or replace them as appropriate with modern enabling technology that meets the requirements of the Business Case Analysis(s) (BCAs).

**E. Performance Metrics**

N/A

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303109N *I Satellite Communications (Space)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 4,680.128 | 45.946 | 37.372 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4,763.446 |
| 0728: *EHF SATCOM Terminals* | 669.749 | 27.240 | 21.116 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 718.105 |
| 0731: *FLTSATCOM* | 38.815 | 3.083 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 41.898 |
| 2472: *Mobile User Objective Sys (MUOS)* | 3,971.564 | 15.623 | 13.867 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4,001.054 |
| 3398: *Enterprise SATCOM Gateway Modems (ESGMs)* | 0.000 | 0.000 | 2.389 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.389 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 290, 345 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with today's Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of A2AD initiatives. The NMT system will replenish and improve on Navy terminal capabilities of the Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS) and Global Broadcast Service (GBS). The new system will equip the warfighters with the assured, jam resistant, secure communications as described in the joint AEHF satellite communications system and WGS Operational Requirements Documents (ORD). The NMT will provide multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Joint Ultra-High Frequency (UHF) Military Satellite Communications (MILSATCOM) Network Integrated Control System (JMINI CS) is a legacy system that commenced in 1998. JMINI CS is a Navy-led, Joint-interest program providing integrated, dynamic, and centralized control of non-processed UHF MILSATCOM 5/25 kHz Demand Assigned Multiple Access (DAMA) and Demand Assigned Single Access (DASA) channels to maximize existing highly sought after SATCOM resources. The system also provides decentralized web-based management of those resources for use as a situational awareness tool for Combatant Commanders, Global SATCOM Support Centers, and Regional SATCOM Support Centers. The system is expected to operate well beyond the original 2015 End of Life (EoL) date to 2033. The JMINI CS Program will perform concept development and exploration to identify cost-effective solutions to address multiple life cycle support issues, in order to minimize loss of service to the fleet. The effort will involve evaluation, development, laboratory and integration testing of Commercial Off-The-Shelf (COTS) and Government off-the-shelf (GOTS) hardware and software to replace obsolete components or subsystems while maintaining interoperability with existing systems.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303109N *I Satellite Communications (Space)* |

The Mobile User Objective System (MUOS) program provides for the development of the next generation Department of Defense (DoD) advanced narrowband communications satellite constellation. The current Ultra-High Frequency (UHF) Follow-On (UFO) constellation relies on the MUOS legacy payload to meet the UHF SATCOM requirement. This MUOS Research Development Test & Evaluation, Navy (RDT&E,N) effort supports Full Operational Capability (FOC) in FY 2020.

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications(MILSATCOM) ACAT IC program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The Joint GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement in place of the Joint Internet. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. GBS augments and interfaces with other communications systems, provides relief to overburdened communications systems already in place, and provides information to previously unsupported users. GBS provides bandwidth five times any other system, up to 45 Mbps of forward link data (shore to ship) per WGS satellite transponder.

Beginning in FY18, the Satellite Communications (Space) funding profiles have moved from PE 0303109N to PE 1203109N.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 47.312 | 37.372 | 47.478 | - | 47.478 |
| Current President's Budget | 45.946 | 37.372 | 0.000 | - | 0.000 |
| Total Adjustments | -1.366 | 0.000 | -47.478 | - | -47.478 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -1.365 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -47.478 | - | -47.478 |
| • Rate/Misc Adjustments | -0.001 | 0.000 | 0.000 | - | 0.000 |

**Change Summary Explanation**

Decrease in Satellite Communications (Space) by $0.93M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

Schedule:
EHF SATCOM Terminals (project 0728) - This project has transferred to a new PE 1203109N FY2018-FY2022.
Enterprise SATCOM Gateway Modems (ESGMs Project 3398) - This project has been transferred to new PE 1203109N FY2018-FY2022.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303109N *I Satellite Communications (Space)* |

Funding:
0728: FY2018-FY2022 NMT, JALN-M and Technology Insertion funding transferred to a new PE 1203109N.
2472: FY2018-FY2022 MUOS funding transferred to a new PE 1203109N.
3398: FY2018-FY2022 ESGMs funding transferred to a new PE 1203109N.

Technical:
EHF SATCOM Terminals (project 0728) and Enterprise SATCOM Gateway Modems (ESGMs) transferred to a new PE 1203109N FY2018-FY2022.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | | | | Project (Number/Name)<br>0728 / *EHF SATCOM Terminals* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 0728: *EHF SATCOM Terminals* | 669.749 | 27.240 | 21.116 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 718.105 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |
| **Project MDAP/MAIS Code:** 290 | | | | | | | | | | | | |

**Note**

NMT FY18-FY22 funding profile has moved to PE 1203109N.

**A. Mission Description and Budget Item Justification**

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas, and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with today's Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system will replenish and improve on Navy Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS), and Global Broadcast Service (GBS) terminal capabilities. The new system will equip the warfighters with assured, jam resistant, secure communications as described in both the joint AEHF Satellite Communications System and the WGS Operational Requirement Documents (ORD). Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the ORD. The NMT will provide multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

Wideband Anti-Jam Modem Systems (WAMS) enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). WAMS enables space segment AJ diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications in the A2AD environment. The use of WAM Protected Tactical Waveform (PTW) on WGS will augment AEHF extended data rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially in an Anti-Access Area Denial (A2AD) satellite denied environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity within the High Capacity Backbone (HCB) Common Data Link (CDL) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document and the JALN Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) NMT waveform for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and intend to develop a pre-planned product improvement to leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. A critical component of A2AD is Adaptive Coding software development incorporation into the baseline NMT terminal in addition to supporting the JALN-M demonstration. This capability

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

autonomously enhances maximum throughput and supports degraded conditions by adjusting End-to-End code rate to provide continuous, mission critical, and protected communications.

Technology Insertion, studies and implementation is necessary for military satellite communications systems development to support emerging technologies for Commercial Broadband Satellite Program (CBSP) and Global Broadcast Service (GBS) Terminals. Efforts will include evaluation of End-to-End performance testing of data rates associated with Broadband and Broadcast transmissions.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** NMT Development | 16.362 | 7.732 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Overall program efforts include investigation of emerging technologies through study, development, and associated testing for feasibility of satellite communications-related program insertion. | | | | | |
| ***FY 2016 Accomplishments:***<br>Initiated Follow-on Operational Test and Evaluation (FOT&E) of the NMT system for testing with the on-orbit Airborne XDR waveform. Continued on-going efforts to test the Enhanced Polar System (EPS) functionality with the NMT system. Continued A2AD development to include the ATIP and AC initiatives. Continued AC software design and development. Initiated development of Wideband Anti Jam Modem System (WAMS) specification and risk reduction crypto interface efforts. Initiated WAMS acquisition documentation to include update of the Acquisition Plan, update APB, Clinger Cohen Act (CCA) and Request for Information (RFI). Developed test plans for Protected Tactical Service Field Demonstration (PTSFD) modems with NMT. Planned for and commenced the ATIP and NMT SATCOM AC Design Verification Tests executed to illustrate specification compliance. Began development of all Fleet logistics support products in support of initial fielding of the SATCOM AC capability. Analyzed network architectures and satellite resource utilization in support of SATCOM AC to ensure realistic fleet implementation. | | | | | |
| ***FY 2017 Plans:***<br>Complete Follow-on Operational Test and Evaluation (FOT&E) of the NMT system for testing with the on-orbit XDR waveform. Continue efforts to test the Enhanced Polar System (EPS) functionality with the NMT system.<br><br>Continue development of the WAMS technical baseline for use with the NMT. Commence and complete studies to modify the NMT to optimize the NMT/WAMS interface based on known existing limitations. Develop design of the Modem Mission Management System (MMS) and Key Management System (KMS). Research and pursue integration strategies for MMS/KMS operational compatibility with DoD enterprise Protected Tactical Enterprise Service (PTES) ground solution architecture. Procure Air Force Engineering Development Model (EDM) modem | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| hardware from three separate vendors for initial Navy testing and verification of Navy requirements. Develop and mature the baseband interface from WAMS to Automated Digital Network Systems (ADNS) that supports the ability for the data rate to change in the dynamic environment to the NMT technical baseline. Develop specific ADNS Service Pack WAM to ADNS Interface Control Document (ICD) for implementing WAMS in the Shipboard and Shore architecture.<br><br>Complete the Advanced Time Division Multiple Access (TDMA) Interface Processor (ATIP) and NMT SATCOM Adaptive Coding (AC) software Design Verification Test executed to illustrate specification compliance. Initiate studies for AC Time of Day (TOD) encryption to enable a more robust, lower code rate when the link margin is degraded and begin Software modifications on the NMT, ATIP, and KIV-7M to implement the capability. Perform technical and system risk reduction and implement the A2AD mitigation strategy for NMT.<br>***FY 2018 Base Plans:***<br>NMT Development FY18 funding profile has moved to PE 1203109N.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Joint Aerial Layer Network Maritime (JALN-M) | 10.878 | 13.284 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued system of systems development, integration, and testing, to include development of capabilities for shipboard and submarine NMT systems to support AEHF Airborne XDR waveform communications with the JALN-M Pod Airborne XDR payload and High Capacity Backbone. Developed detailed test plans for validating the JALN-M Airborne XDR payload.<br>***FY 2017 Plans:***<br>Continue system of systems development, integration, and testing. Includes completion of design verification of JALN-M capabilities of NMT by testing with the Airborne XDR payload. Perform ATIP, Adaptive Coding and Automated Digital Network System (ADNS) integration testing. Continue design verification of JALN-M capabilities of NMT by testing with the Airborne XDR payload and the Position Reporting System / Topology Manager (PRS/TM) Plan. Create all data needed to obtain approval for Interim Authority To Test (IATT) associated with NMT and ATIP for the JALN-M demonstration. Begin installing the JALN-M capabilities and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| execute site verification by using the AEHF satellite for End-to-End SATCOM Adaptive Coding. Create detailed test plans and scenario data for the JALN-M FY18 Demonstration.<br>***FY 2018 Base Plans:***<br>Joint Aerial Layer Network Maritime (JALN-M) FY18 funding profile has moved to PE 1203109N.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Technology Insertion<br>***Articles:***<br>***Description:*** Overall program efforts include technology insertion implementation and associated testing required to support satellite communications.<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Develop Test Plan and Procedures for Development Test (DT) and Operational Test (OT) of Commercial Broadband Satellite Program (CBSP) Force Level Variant (FLV) Capacity Key Performance Parameter (KPP) to evaluate End-to-End performance of data rates throughout the shipboard network.<br>***FY 2018 Base Plans:***<br>Technology Insertion FY18 funding has transferred to PE 1203109N.<br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.100<br>- | 0.000<br>- | 0.000<br>- | 0.000<br>- |
| **Accomplishments/Planned Programs Subtotals** | 27.240 | 21.116 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/3216: *Navy Multiband Terminal (NMT)* | 118.142 | 38.365 | 69.764 | - | 69.764 | 99.741 | 98.101 | 22.528 | 14.462 | 74.074 | 1,388.196 |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

**D. Acquisition Strategy**

The NMT Follow-On Full Deployment (FOFD) contract will continue NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and will allow the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to COMTECH supports the development of Anti-Access Area Denial (A2AD).

**E. Performance Metrics**

The RDT&E goal for the NMT program is to create a military satellite communications system that consolidates capabilities of current and future satellite systems into a single terminal. SATCOM-related technology insertion, studies and associated testing will support the GBS and CBSP Programs.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development | Various | Various : Various | 431.733 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 431.733 | - |
| Software Development | C/CPAF | Raytheon : Marlborough, MA | 71.425 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 12.492 | 83.917 | - |
| Systems Engineering | WR | SSC PAC : San Diego, CA | 22.088 | 0.000 | | 3.102 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 25.190 | - |
| Systems Engineering | WR | NUWC : Newport, RI | 34.122 | 3.000 | Jan 2016 | 3.051 | Jan 2017 | 0.000 | | - | | 0.000 | 3.000 | 43.173 | - |
| WAMS EDM Hardware | C/CPIF | RAYTHEON : Marlborough, MA | 0.000 | 0.000 | | 0.600 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.600 | - |
| WAMS EDM Hardware | C/CPIF | L3 Systems West : Salt Lake City, UT | 0.000 | 0.000 | | 0.600 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.600 | - |
| WAMS EDM Hardware | C/CPIF | ViaSat : Carlsbad, CA | 0.000 | 0.000 | | 0.600 | May 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.600 | - |
| Software Development JALN-M | C/CPAF | RAYTHEON : Marlborough, MA | 0.000 | 12.492 | Dec 2015 | 3.200 | Mar 2017 | 0.000 | | - | | 0.000 | 0.000 | 15.692 | - |
| Systems Engineering | C/CPAF | Systech : San Diego, CA | 5.438 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.438 | - |
| Software Development Time of Day (TOD) | C/CPAF | RAYTHEON : Marlborough, MA | 0.000 | 0.000 | | 1.102 | Jan 2017 | 0.000 | | - | | 0.000 | 0.000 | 1.102 | - |
| Systems Engineering | C/CPFF | MIT/LL : Marlborough, MA | 0.000 | 0.400 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.400 | 0.800 | - |
| Software Development ATIP Adaptive Coding (AC) /Time of Day (TOD) | C/CPFF | COMTECH : Tempe, AZ | 24.597 | 2.866 | Dec 2015 | 1.100 | Nov 2016 | 0.000 | | - | | 0.000 | 2.867 | 31.430 | - |
| | | **Subtotal** | 589.403 | 18.758 | | 13.355 | | 0.000 | | - | | 0.000 | 18.759 | 640.275 | - |

**Remarks**

FY17 initiated studies for the Adaptive Coding Time of Day effort. FY18 NMT Product Development focuses on the complexity of software design development across systems and vendors to support Adaptive Coding Time of Day (TOD) Encryption. Additionally the program will be performing NMT testing with Enhanced Polar Systems (EPS) and will initiate testing of the PTSFD EDM modems. NMT FY18 funding profile has moved to PE 1203109N.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | Project (Number/Name)<br>0728 / *EHF SATCOM Terminals* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support | Various | Various : Various | 25.722 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 25.722 | - |
| Software Integration/ Government Oversight | WR | NUWC : Newport, RI | 0.272 | 2.008 | Nov 2015 | 1.887 | Nov 2016 | 0.000 | | - | | 0.000 | 2.008 | 6.175 | - |
| Software Engineering Support | C/CPAF | SYSTECH : San Diego, CA | 1.365 | 1.194 | Nov 2015 | 0.660 | Nov 2016 | 0.000 | | - | | 0.000 | 1.194 | 4.413 | - |
| Software Integration Support | WR | SSC PAC : San Diego, CA | 0.000 | 1.266 | Jan 2016 | 0.733 | Nov 2016 | 0.000 | | - | | 0.000 | 1.266 | 3.265 | - |
| | | **Subtotal** | 27.359 | 4.468 | | 3.280 | | 0.000 | | - | | 0.000 | 4.468 | 39.575 | - |

**Remarks**

NMT FY18 funding profile has moved to PE 1203109N.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPS & JALN-M Development | WR | SSC PAC : San Diego, CA | 22.197 | 2.000 | Nov 2015 | 2.789 | Nov 2016 | 0.000 | | - | | 0.000 | 2.000 | 28.986 | - |
| Operational Test & Evaluation 1 | WR | COMOPTEVFOR : Norfolk, VA | 5.869 | 0.100 | Nov 2015 | 0.100 | Nov 2016 | 0.000 | | - | | 0.000 | 0.100 | 6.169 | - |
| Developmental Test & Evaluation | C/CPAF | Raytheon : Marlborough, MA | 3.947 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.947 | - |
| | | **Subtotal** | 32.013 | 2.100 | | 2.889 | | 0.000 | | - | | 0.000 | 2.100 | 39.102 | - |

**Remarks**

NMT FY18 funding profile has moved to PE 1203109N.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contract Management | C/CPFF | BAH : San Diego | 9.225 | 0.220 | Nov 2015 | 0.200 | Nov 2016 | 0.000 | | - | | 0.000 | 0.220 | 9.865 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | C/CPFF | BAH : San Diego | 9.245 | 1.654 | Nov 2015 | 1.342 | Nov 2016 | 0.000 | | - | | 0.000 | 1.654 | 13.895 | - |
| Acquisition Management | WR | NCCA : Various | 0.653 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.653 | - |
| Travel | Reqn | SPAWAR : Various | 1.851 | 0.040 | Nov 2015 | 0.050 | Nov 2016 | 0.000 | | - | | 0.000 | 0.040 | 1.981 | - |
| | | **Subtotal** | 20.974 | 1.914 | | 1.592 | | 0.000 | | - | | 0.000 | 1.914 | 26.394 | - |

**Remarks**

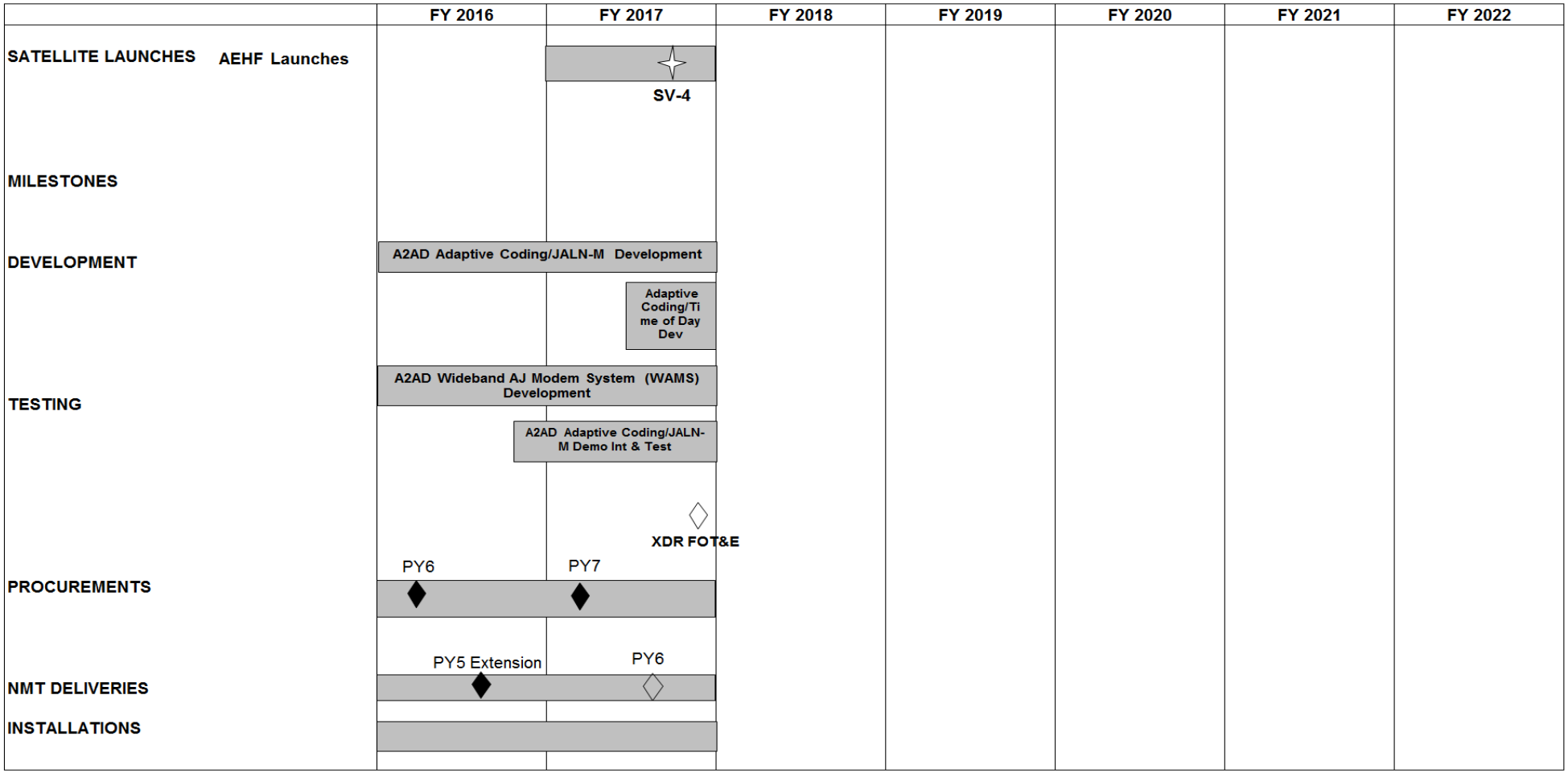
NMT FY18 funding profile has moved to PE 1203109N.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 669.749 | 27.240 | | 21.116 | | 0.000 | | - | | 0.000 | 27.241 | 745.346 | - |

**Remarks**

NMT FY18 funding profile has moved to PE 1203109N.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |




**Note: FY18-FY22 NMT funding profile resides in PE 1203109N.**

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0728*** | | | | |
| Procurement Year 6 (PY6) | 1 | 2016 | 1 | 2016 |
| FRP PY5 Extension Delivery | 3 | 2016 | 3 | 2016 |
| AEHF Launch SV-4 | 3 | 2017 | 3 | 2017 |
| A2AD Adaptive Coding & JALN-M Development | 1 | 2016 | 4 | 2017 |
| A2AD Wideband AJ Modem Development | 1 | 2016 | 4 | 2017 |
| XDR FOT&E | 4 | 2017 | 4 | 2017 |
| A2AD Wideband AJ Modem System (WAMS) Development | 1 | 2016 | 4 | 2017 |
| Procurement Year 7 (PY7) | 1 | 2017 | 1 | 2017 |
| FRP PY6 Delivery | 3 | 2017 | 3 | 2017 |
| A2AD Adaptive Coding/Time of Day | 3 | 2017 | 4 | 2017 |
| A2AD Adaptive Coding/JALN-M Demo Integration & Test | 4 | 2016 | 4 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | Project (Number/Name)<br>0731 / *FLTSATCOM* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0731: *FLTSATCOM* | 38.815 | 3.083 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 41.898 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Joint Ultra-High Frequency (UHF) Military Satellite Communications (MILSATCOM) Network Integrated Control System (JMINI CS) is a legacy system that commenced development in 1998. JMINI CS is a Navy-led, Joint interest program providing integrated, dynamic, and centralized control of non-processed UHF MILSATCOM 5/25 kHz Demand Assigned Multiple Access (DAMA) and Demand Assigned Single Access (DASA) channels to maximize existing highly sought after SATCOM resources used to support operational missions as well as joint training and tactical exercises. The system provides decentralized web-based management of those resources for use as a situational awareness tool for Combatant Commanders and SATCOM Support Centers. The JMINI CS is required to operate beyond the original End of Life (EoL) of 2015 in order to continue to support mission critical operations through at least 2033. The JMINI CS Program of Record (POR) will perform concept development and exploration to identify cost-effective solutions to address multiple life cycle support issues in order to address the increasing risk of an unrecoverable hardware or software failure, which would result in a loss of service for the fleet. The effort will involve evaluation, prototype development, laboratory and integration testing of Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) hardware and software to replace obsolete components or subsystems while maintaining interoperability with existing platforms/systems.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** JMINI CS | 3.083 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completion of documentation and testing of software and hardware required for fielding decisions. | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>N/A | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.083 | 0.000 | 0.000 | 0.000 | 0.000 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>0731 / *FLTSATCOM* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/3215: *JMINI* | 4.491 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 90.772 |

**Remarks**

**D. Acquisition Strategy**

JMINI CS: The Joint Ultra-High Frequency (UHF) Military Satellite Communications (MILSATCOM) is an ACAT IV (T) system that is post-FRP. As a legacy system that commenced in 1998, JMINI CS is expected to operate well beyond the original 2015 End of Life (EoL) date. The projected EoL for JMINI CS extends past 2033. The JMINI CS Program of Record (POR) will evaluate the most cost-effective solutions to address multiple life cycle support issues, in order to minimize loss of service to the fleet. The effort will involve evaluating Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) hardware and software, and conducting laboratory/ integration testing to ensure proper functionality and interoperability.

**E. Performance Metrics**

JMINI CS: The JMINI CS POR will perform concept development and exploration of the JMINI CS 5 kHz and 25 kHz systems, to analyze alternatives for the most advantageous use of new technologies to extend the JMINI CS system life span in order to minimize loss of service to the Fleet.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | | | | Project (Number/Name)<br>2472 / *Mobile User Objective Sys (MUOS)* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2472: *Mobile User Objective Sys (MUOS)* | 3,971.564 | 15.623 | 13.867 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4,001.054 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 345

**Note**

Project 2472 will be realigned to PE 1203109N FY2018-FY2022

**A. Mission Description and Budget Item Justification**

The Mobile User Objective System (MUOS) provides a worldwide, multi-service population of mobile and fixed-site terminal users with Ultra-High Frequency (UHF), narrowband, beyond line of sight satellite communications (SATCOM). MUOS significantly increases performance and capacity in support of critical Combatant Command SATCOM priorities. MUOS is the replacement system for the UHF Follow-on (UFO) system, which is currently beyond its design life. MUOS consists of Space, Ground, and User Entry Segments. The Space Segment consists of 5 geosynchronous satellites, one which is an on-orbit spare, and provides both a legacy UHF payload, which is backward compatible with UFO, and a Wideband Code Division Multiple Access (WCDMA) payload, which provides 3G cellular-like capability. The Ground Segment consists of four world-wide Radio Access Facilities (RAFs) and two satellite control facilities. Each RAF includes three 60 ft. antennas, and numerous racks of equipment. The RAF in Hawaii includes a Network Management Facility (NMF). The RAFs in Hawaii and Virginia each include a Switching Facility (SF). The User Entry Segment consists of the MUOS waveform that is ultimately integrated into MUOS-capable terminals. The MUOS legacy capability has been in operational use since 2012, and the WCDMA capability transitioned to Early Combatant Command Use in July 2016.

In addition to providing UHF SATCOM for the Department of Defense (DoD), the Navy has the overall responsibility to deliver the End-to-End (E2E) MUOS capability to the warfighter. This responsibility involves systems engineering, integration, and test management of all MUOS system of system activities, to include the integration of the MUOS waveform into MUOS-capable terminals and the subsequent terminal certification testing.

In June 2016 based on the results of the Multi-Service Operational Test and Evaluation-2 (MOT&E-2), Director, Operational Test & Evaluation (DOT&E) assessed MUOS not operationally effective or suitable. As a result of the program addressing findings and preparing for MOT&E-2B in FY19, Full Operational Capability (FOC) has been moved to FY20.

The budget line beginning in FY17 is dedicated to completion of the MOT&E-2B activities, system optimization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates, and testing to support certification of MUOS-capable terminals.

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Mobile User Objective Sys (MUOS) | 15.623 | 13.867 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued terminal integration and testing of MUOS capable terminal hardware/software devices to ensure interoperability with the MUOS ground system. Completed engineering capability assessments in preparation for FY16 Multi-Service Operational Test and Evaluation (MOT&E). Conducted the MOT&E-2. Completed Information Assurance (IA) vulnerability fixes identified during the IA Control Validations (IACV) at all sites and regression test (acceptance test) of IA issues. Conducted engineering and acceptance test activities to address IA and emergent system requirements/enhancements in relation to operational environment. | | | | | |
| ***FY 2017 Plans:***<br>Continue to support integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals in support of the U.S. Army Handheld, Manpack, and Small Form Fit (HMS) terminal program. Address operational test deficiencies and prepare for FY19 MOT&E-2B activities, particularly addressing the capability to monitor system status and provide situational awareness for the system operators. Continue to address emerging cybersecurity requirements. Continue development and delivery of a modernized geolocation Ground Segment subsystem in order to meet baseline requirements. | | | | | |
| ***FY 2018 Base Plans:***<br>N/A | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 15.623 | 13.867 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN/2433: *Mobile User Objective System (MUOS)* | 35.961 | 36.723 | 46.357 | - | 46.357 | 68.018 | 70.225 | 55.935 | 48.248 | 757.868 | 3,150.400 |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

**D. Acquisition Strategy**

Currently sustainment and engineering activities are procured via the baseline MUOS Risk Reduction and Design Development contract. The program is working to transition these activities to dedicated sustainment contracts for the Ground/User Entry and Space Segments. Integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals are executed primarily by the Navy Working Capital Funded SPAWAR Systems Center Pacific.

**E. Performance Metrics**

MUOS Goal: Achieve Full Operational Capability in FY 2020.

Metric: Successfully complete 5 developmental test assist events in FY18, and Multi-Service Operational Test and Evaluation-2B FY19.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RRDD AOS Contract | C/CPAF | Lockheed Martin (LM) : Sunnyvale, CA | 3,538.047 | 12.480 | Mar 2016 | 6.967 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 3,557.494 | - |
| Product Development PY | Various | Various : Various | 133.670 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 133.670 | - |
| | | **Subtotal** | 3,671.717 | 12.480 | | 6.967 | | 0.000 | | - | | 0.000 | 0.000 | 3,691.164 | - |

**Remarks**

In accordance with Program Office's Acquisition Strategy, engineering services will be continued and negotiated on a new contract vehicle to be awarded in FY18.
Increase of ~$600K in RRDD AOS Contract (Engineering Contract) from FY17 to FY18 due to increased efforts to address Operational Test deficiencies.
Funding moved from PE 0303109N to 1203109N starting in FY18.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support PY | Various | Various : Various | 38.378 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 38.378 | - |
| | | **Subtotal** | 38.378 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 38.378 | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | SSC PAC : San Diego, CA | 23.178 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 23.178 | - |
| Operational Test & Evaluation | WR | OPTEVFOR : Norfolk, VA | 6.096 | 1.995 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.091 | - |
| | | **Subtotal** | 29.274 | 1.995 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 31.269 | - |

**Remarks**

Increase of $1.765M in Test and Evaluation efforts from FY17 to FY18 due to Test Assist Events in preparation for MOT&E-2B.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | Project (Number/Name)<br>2472 / *Mobile User Objective Sys (MUOS)* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Funding moved from PE 0303109N to 1203109N starting in FY18. | | | | | | | | | | | | | | | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | Various | Various : Various | 145.020 | 0.343 | Nov 2015 | 3.000 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 148.363 | - |
| Government Engineering | Various | Various : Various | 37.639 | 0.805 | Oct 2015 | 3.900 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 42.344 | - |
| Travel | WR | PMW 146 : San Diego, CA | 2.623 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.623 | - |
| Management Services PY | Various | Various : Various | 46.913 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 46.913 | - |
| | | **Subtotal** | 232.195 | 1.148 | | 6.900 | | 0.000 | | - | | 0.000 | 0.000 | 240.243 | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

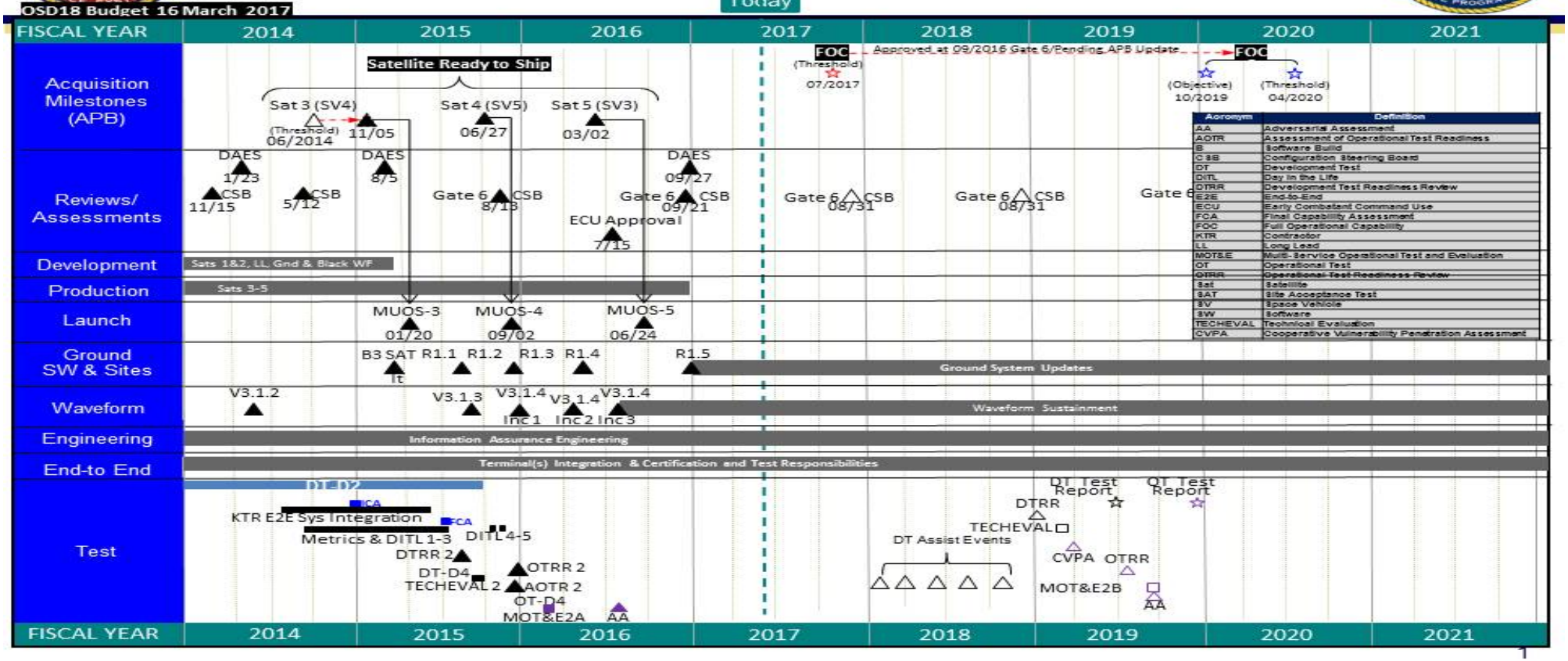
| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 3,971.564 | 15.623 | | 13.867 | | 0.000 | | - | | 0.000 | 0.000 | 4,001.054 | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

# MUOS Program Schedule



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2472*** | | | | |
| Information Assurance Engineering | 1 | 2016 | 4 | 2017 |
| Terminal Integration, Certification, and Test | 1 | 2016 | 4 | 2017 |
| Production Satellites | 1 | 2016 | 4 | 2016 |
| OT-D4 Multi-Service Operational Testing & Evaluation 2A | 1 | 2016 | 1 | 2016 |
| Ready to Ship date #5 | 2 | 2016 | 2 | 2016 |
| Early Combatant Command Use Approval | 3 | 2016 | 3 | 2016 |
| Launch of Satellite #5 (MUOS 5) | 3 | 2016 | 3 | 2016 |
| Waveform Sustainment | 3 | 2016 | 4 | 2017 |
| Gate 6/CSB FY16 | 4 | 2016 | 4 | 2016 |
| DAES | 4 | 2016 | 4 | 2016 |
| Gate 6/CSB FY17 | 4 | 2017 | 4 | 2017 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303109N / *Satellite Communications (Space)* | Project (Number/Name)<br>3398 / *Enterprise SATCOM Gateway Modems (ESGMs)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3398: *Enterprise SATCOM Gateway Modems (ESGMs)* | 0.000 | 0.000 | 2.389 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.389 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

ESGM's FY18-FY19 funding profile has moved to PE 1203109N.

**A. Mission Description and Budget Item Justification**

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. GBS provides Satellite Communications (SATCOM) capability for forces afloat, ashore, and Naval Special Warfare Command.

The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement. This modem will replace the existing modem in the GBS System. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. Additionally, the ESGM will continue to enable GBS reception of the Digital Video Broadcast - Satellite 2nd Generation (DVB-S2).

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Enterprise SATCOM Gateway Modems (ESGMs) | 0.000 | 2.389 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Begin integration and testing necessary to support the Enterprise Satellite Communications Gateway Modems (ESGM) technical baseline for use in Global Broadcast Service (GBS) in the joint operational environment to support Joint TRANSEC requirement on the Radio Frequency (RF) segment. Begin planning for qualification testing for Navy-specific requirements. GBS Joint ESGM Developmental Test (DT) and Operational Test (OT) activities for ESGM integration with the system will be scheduled to begin during this timeframe; to conduct the | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303109N / *Satellite Communications (Space)* | **Project (Number/Name)**<br>3398 / *Enterprise SATCOM Gateway Modems (ESGMs)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ESGM design and application integration verification tests to illustrate specification compliance with Navy C4I systems.<br>***FY 2018 Base Plans:***<br>Enterprise SATCOM Gateway Modems (ESGMs) FY18 funding profile resides in PE 1203109N.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 2.389 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The GBS program reached a Full Rate Production Decision on 24 Oct 2008 and is in sustainment. The Enterprise Satellite Communications (SATCOM) Gateway Modem (ESGM), the Commercial Off-The-Shelf (COTS) Internet Protocol (IP) modem, provides Transmission Security functionality in support of DoD CIO direction to implement Information Assurance for all transmission media.

**E. Performance Metrics**

The RDT&E goal for the GBS program is to create a military satellite communications system that supports current and future requirements for Anti-Access/Area Denial and Information Assurance.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 158.117 | 21.522 | 23.541 | 24.271 | - | 24.271 | 22.410 | 23.085 | 23.574 | 24.048 | 280.704 | 601.272 |
| 9C87: *CANES Integration* | 158.117 | 21.522 | 23.541 | 24.271 | - | 24.271 | 22.410 | 23.085 | 23.574 | 24.048 | 280.704 | 601.272 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** M417 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves for all basic network services (email, web, chat, collaboration) to a wide variety of Navy surface combatants, submarines and maritime operations centers. Hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Integrating these applications and systems is accomplished through the Application Integration process, which is used to evaluate and validate compatibility between CANES and the Navy-validated applications, systems and services. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), are dependent on CANES to field, host, and sustain their capability because they no longer provide their own hardware. In addition, CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two programs.

CANES is programmed to develop regular technical updates to its hardware and software baselines to ensure that no cybersecurity vulnerabilities exist due to hardware and software obsolescence. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. This will allow for streamlined acquisition, contracting, and test events, and significant lifecycle efficiencies through consolidation of multiple current configuration management baselines, logistics, and training efforts into a unified support structure.

In FY 2018, CANES RDT&E investment will complete TI 2 hardware and software baseline development and initiate development of TI 3 software baseline including E2C laboratory engineering efforts. Perform systems engineering efforts for TI 3 to complete functional baselines and update technical data packages.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)* |

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 21.667 | 23.541 | 23.922 | - | 23.922 |
| Current President's Budget | 21.522 | 23.541 | 24.271 | - | 24.271 |
| Total Adjustments | -0.145 | 0.000 | 0.349 | - | 0.349 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.145 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.349 | - | 0.349 |

**Change Summary Explanation**

Technical: N/A

Funding:
N/A

Schedule:
Operational commitments for the CANES Force Level Follow-On Test and Evaluation (FOT&E) test platform caused the Force Level DT and Force Level FOT&E test events to be re-phased. Development Testing for submarines shifted to Q1FY19 due to submarine test platform operational commitments. Full Deployment has been re-phased to align with program's Full Deployment Decision (FDD), which was updated to accommodate acquisition documentation requirements. FDD was achieved in 1QFY16.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | Project (Number/Name)<br>9C87 / *CANES Integration* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9C87: *CANES Integration* | 158.117 | 21.522 | 23.541 | 24.271 | - | 24.271 | 22.410 | 23.085 | 23.574 | 24.048 | 280.704 | 601.272 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** M417

**A. Mission Description and Budget Item Justification**

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves for all basic network services (email, web, chat, collaboration) to a wide variety of Navy surface combatants, submarines and maritime operations centers. Hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Integrating these applications and systems is accomplished through the Application Integration process, which is used to evaluate and validate compatibility between CANES and the Navy-validated applications, systems and services. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), are dependent on CANES to field, host, and sustain their capability because they no longer provide their own hardware. In addition, CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two programs.

CANES is programmed to develop regular technical updates to its hardware and software baselines to ensure that no cybersecurity vulnerabilities exist due to hardware and software obsolescence. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. This will allow for streamlined acquisition, contracting, and test events, and significant lifecycle efficiencies through consolidation of multiple current configuration management baselines, logistics, and training efforts into a unified support structure.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** CANES Integration | 21.522 | 23.541 | 24.271 | 0.000 | 24.271 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Achieved Full Deployment Decision (FDD). Completed Technical Insertion (TI) software baseline development and initiated development for TI 2 hardware and software baseline including E2C laboratory engineering efforts. Performed systems engineering efforts to complete functional baselines and updates to technical data packages. Continued Follow-On Test & Evaluation (FOT&E) in support of force level testing. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | **Project (Number/Name)**<br>9C87 / *CANES Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue TI 2 hardware and software baseline testing, including E2C laboratory engineering efforts. Perform systems engineering efforts to complete functional baselines and update technical data packages. Complete FOT&E in support of force level testing. Perform Development Testing (DT) Assist for TI 2 hardware and software development.<br>***FY 2018 Base Plans:***<br>Complete TI 2 hardware and software baseline development and initiate development of TI 3 software baseline including<br>E2C laboratory engineering efforts. Perform systems engineering efforts for TI 3 to complete functional baselines and update technical data packages.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 21.522 | 23.541 | 24.271 | 0.000 | 24.271 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/2915: *CANES* | 274.641 | 212.030 | 322.754 | - | 322.754 | 419.686 | 406.255 | 364.389 | 410.379 | 2,472.031 | 5,951.156 |
| • OPN/2925: *CANES Intell* | 28.695 | 36.013 | 48.028 | - | 48.028 | 59.321 | 56.636 | 49.192 | 50.176 | 446.377 | 1,029.470 |

**Remarks**

**D. Acquisition Strategy**

CANES is an ACAT IAC Major Automated Information System (MAIS) program. The program office employed a multiple-phase, multiple-award down-select contract strategy to reduce program risks and maintain competition in both design development and limited production during contract performance. Milestone C was achieved in 1QFY13 and Full Deployment Decision (FDD) was achieved in 1QFY16. In 2QFY15, a separate full and open indefinite delivery indefinite quantity (IDIQ) multiple award contract (MAC) production contract was awarded to support future production. CANES is programmed to develop regular technical updates to its hardware and software baselines to ensure that no cybersecurity vulnerabilities exist due to hardware and software obsolescence.

**E. Performance Metrics**

Early RDT&E investment and sustainment of dual design contractors through the development phase reduced Total Ownership Cost (TOC) from Milestone B to Milestone C. Cost avoidance throughout the life of the program is based on 1) reducing the number of networks through the use of mature, certified, cross domain technologies; 2) reducing the infrastructure footprint and associated costs for hardware afloat; and 3) providing increased capability to meet current and projected war fighter requirements.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | Project (Number/Name)<br>9C87 / *CANES Integration* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Product Development | Various | Various : Various | 52.910 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 52.910 | 22.329 |
| Primary Hardware Development | WR | SSC : San Diego, CA and Charleston, SC | 38.562 | 7.507 | Nov 2015 | 8.617 | Jan 2017 | 9.120 | Nov 2017 | - | | 9.120 | 192.514 | 256.320 | 209.438 |
| Primary Hardware Development | C/CPFF | AUSGAR : San Diego, CA | 0.182 | 0.240 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.422 | - |
| Primary Hardware Development | C/CPFF | ImagineOne : Colonial Beach, VA | 0.432 | 0.286 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.718 | - |
| Primary Hardware Development | C/CPFF | Navy Systems Management Agency (NSMA) : Washington DC | 0.000 | 0.660 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.660 | - |
| Primary Hardware Development | C/CPFF | Client Solution Architects (CSA) : San Diego, CA | 0.000 | 0.150 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.150 | - |
| Primary Software Development | C/CPFF | AUSGAR : San Diego, CA | 0.000 | 0.224 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.224 | - |
| Primary Software Development | WR | SSC : San Diego, CA and Charleston, SC | 20.347 | 6.569 | Nov 2015 | 7.936 | Nov 2016 | 9.821 | Nov 2017 | - | | 9.821 | 52.439 | 97.112 | 48.574 |
| Primary Software Development | C/CPFF | Carahsoft : Reston, VA | 0.000 | 0.185 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.185 | - |
| Primary Software Development | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.397 | Apr 2017 | 0.390 | Dec 2017 | - | | 0.390 | 0.000 | 0.787 | - |
| Systems Engineering | C/CPFF | Systems Research and Applications (SRA) : San Diego, CA | 0.000 | 0.116 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.116 | - |
| Systems Engineering | C/CPFF | Innovative Defense Technologies (IDT) : Arlington, VA | 0.000 | 0.240 | Apr 2016 | 0.668 | Jun 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.908 | - |
| Systems Engineering | C/CPFF | Booz Allen Hamilton (BAH) : San Diego, CA | 1.393 | 0.220 | Jul 2016 | 0.657 | Dec 2016 | 0.670 | Dec 2017 | - | | 0.670 | 0.000 | 2.940 | 0.690 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | **Project (Number/Name)**<br>9C87 / *CANES Integration* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | C/CPFF | Science Applications International Corp. (SAIC) : San Diego, CA | 0.277 | 0.169 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.446 | - |
| Systems Engineering | WR | SSC : San Diego, CA and Charleston, SC | 22.630 | 2.415 | Nov 2015 | 3.434 | Nov 2016 | 2.520 | Nov 2017 | - | | 2.520 | 45.743 | 76.742 | 50.798 |
| Systems Engineering | MIPR | US ARMY CECOM (MITRE) : San Diego, CA | 2.222 | 0.000 | | 0.300 | Dec 2016 | 0.300 | Nov 2017 | - | | 0.300 | 5.722 | 8.544 | 19.934 |
| Systems Engineering | C/CPFF | CSA : San Diego, CA | 0.165 | 0.556 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.721 | - |
| Systems Engineering | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 0.230 | Dec 2017 | - | | 0.230 | 0.000 | 0.230 | - |
| | | **Subtotal** | 139.120 | 19.537 | | 22.009 | | 23.051 | | - | | 23.051 | 296.418 | 500.135 | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Studies & Design | MIPR | Washington HQ Services : Washington DC | 0.650 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.650 | 0.650 |
| Studies & Design | WR | SSC : San Diego, CA | 0.388 | 0.218 | Nov 2015 | 0.195 | Jan 2017 | 0.460 | Nov 2017 | - | | 0.460 | 0.000 | 1.261 | - |
| Studies and Design | C/CPFF | SRA : San Diego, CA | 0.000 | 0.112 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.112 | - |
| Certification Authority | C/CPFF | AUSGAR : San Diego,CA | 1.300 | 0.649 | Mar 2016 | 0.000 | | 0.000 | | - | | 0.000 | 10.987 | 12.936 | - |
| Certification Authority | C/CPFF | NSMA : Washington, DC | 0.370 | 0.000 | | 0.214 | Apr 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.584 | - |
| Certification Authority | C/CPFF | Innovative Defense Technologies (IDT) : Arlington, VA | 0.167 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.167 | - |
| Certification Authority | C/CPFF | Booz Allen Hamilton (BAH) : San Diego,CA | 0.000 | 0.000 | | 0.695 | Dec 2016 | 0.450 | Dec 2017 | - | | 0.450 | 0.000 | 1.145 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | Project (Number/Name)<br>9C87 / *CANES Integration* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Subtotal** | 2.875 | 0.979 | | 1.104 | | 0.910 | | - | | 0.910 | 10.987 | 16.855 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operational Test & Evaluation | WR | COTF : Norfolk, VA | 2.064 | 0.651 | Dec 2015 | 0.000 | | 0.250 | Dec 2017 | - | | 0.250 | 8.510 | 11.475 | 5.891 |
| Operational Test & Evaluation | MIPR | JITC : Fairfax, VA | 0.000 | 0.000 | | 0.167 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.167 | - |
| Development Test & Evaluation | WR | SSC : San Diego, CA | 0.406 | 0.105 | Nov 2015 | 0.145 | Nov 2016 | 0.000 | | - | | 0.000 | 3.967 | 4.623 | - |
| Development Test & Evaluation | MIPR | JITC : Fairfax, VA | 1.368 | 0.250 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 4.015 | 5.633 | 4.673 |
| Development Test & Evaluation | MIPR | DTIC : Ft Belvoir, VA | 0.100 | 0.000 | | 0.061 | Feb 2017 | 0.000 | | - | | 0.000 | 0.000 | 0.161 | - |
| | | **Subtotal** | 3.938 | 1.006 | | 0.373 | | 0.250 | | - | | 0.250 | 16.492 | 22.059 | - |

**Management Services ($ in Millions)**

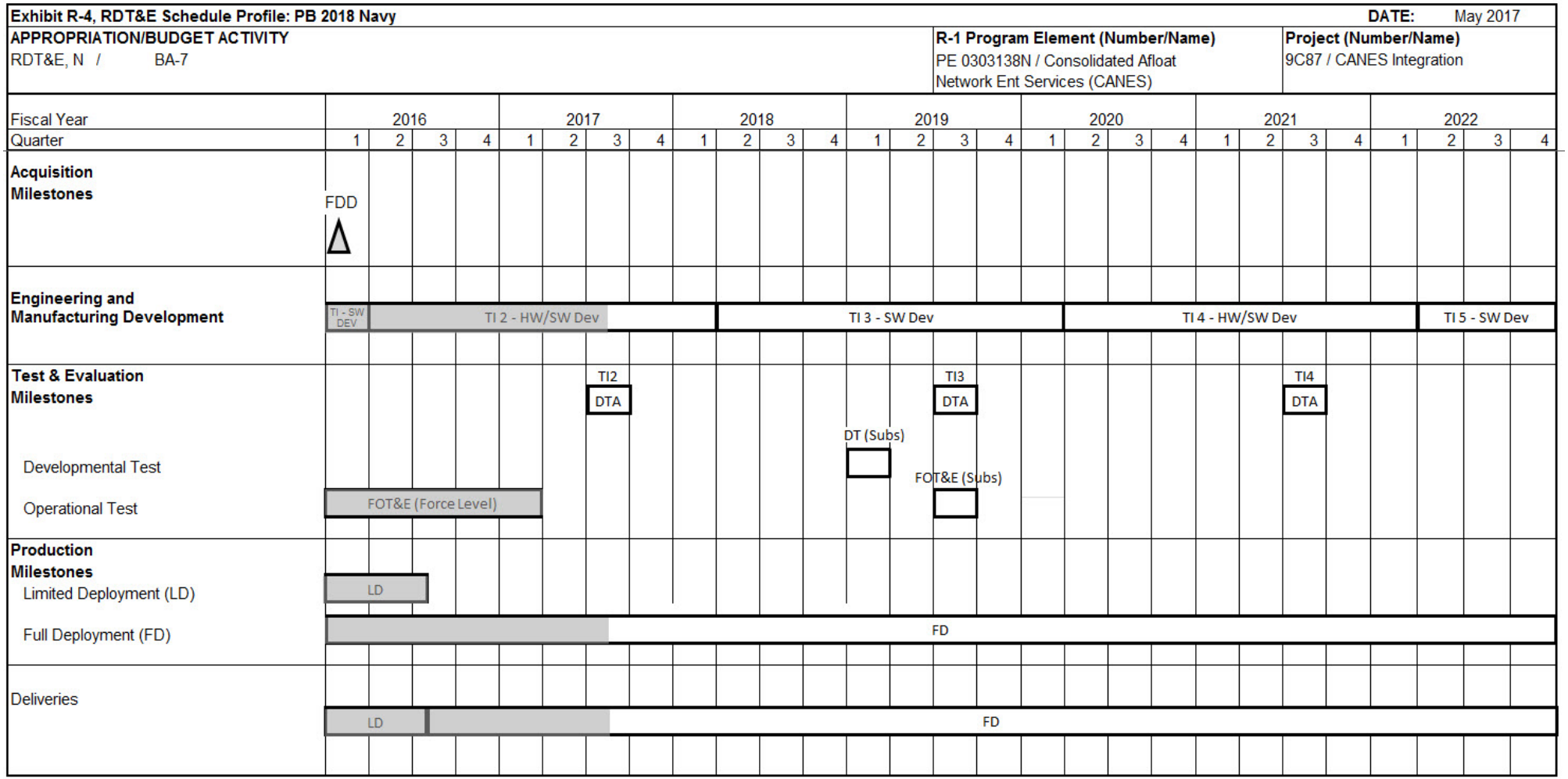
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prior Year Management Services | Various | Various : Various | 11.980 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.980 | 2.742 |
| Program Management | C/CPFF | CSA : San Diego, CA | 0.204 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 8.732 | 8.936 | - |
| Program Management | C/CPFF | STF : San Diego, CA | 0.000 | 0.000 | | 0.055 | Jan 2017 | 0.060 | Nov 2017 | - | | 0.060 | 0.000 | 0.115 | - |
| | | **Subtotal** | 12.184 | 0.000 | | 0.055 | | 0.060 | | - | | 0.060 | 8.732 | 21.031 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | Project (Number/Name)<br>9C87 / *CANES Integration* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 158.117 | 21.522 | | 23.541 | | 24.271 | | - | | 24.271 | 332.629 | 560.080 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | **Project (Number/Name)**<br>9C87 / *CANES Integration* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)* | **Project (Number/Name)**<br>9C87 / *CANES Integration* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Fiscal Year*** | | | | |
| Acquisition Milestone: Acquisition Milestone - Full Deployment Decision Review (FDD) | 1 | 2016 | 1 | 2016 |
| Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - Technical Insertion (TI) Software (SW) Development | 1 | 2016 | 1 | 2016 |
| Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 2 Hardware (HW)/SW Development | 2 | 2016 | 1 | 2018 |
| Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 3 SW Development | 2 | 2018 | 1 | 2020 |
| Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 4 HW/SW Development | 2 | 2020 | 1 | 2022 |
| Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 5 SW Development | 2 | 2022 | 4 | 2022 |
| Test & Evaluation Milestone: Development Test: Development Test Assist- TI 2 | 3 | 2017 | 3 | 2017 |
| Test & Evaluation Milestone: Development Test: Development Test Assist- TI 3 | 3 | 2019 | 3 | 2019 |
| Test & Evaluation Milestone: Development Test: Development Test Assist- TI 4 | 3 | 2021 | 3 | 2021 |
| Test & Evaluation Milestone: Development Test: Developmental Test - Sub | 1 | 2019 | 1 | 2019 |
| Test & Evaluation Milestone: Operational Test: Operational Test Force Level - Follow-on Operational Test & Evaluation (FOT&E) | 1 | 2016 | 1 | 2017 |
| Test & Evaluation Milestone: Operational Test: Operational Test - FOT&E Sub | 3 | 2019 | 3 | 2019 |
| Production Milestone: Limited Deployment: Production Milestone - Limited Deployment (LD) | 1 | 2016 | 3 | 2016 |
| Production Milestone: Full Deployment: Production Milestone - Full Deployment (FD) | 1 | 2016 | 4 | 2022 |
| Deliveries: Deliveries - Limited Deployment (LD) | 1 | 2016 | 3 | 2016 |
| Deliveries: Deliveries - Full Deployment (FD) | 3 | 2016 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0303140N *I Information Sys Security Program* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 393.106 | 29.491 | 38.510 | 50.269 | - | 50.269 | 53.013 | 49.927 | 45.859 | 39.056 | Continuing | Continuing |
| 0734: *Communications Security R&D* | 378.730 | 27.371 | 36.987 | 47.854 | - | 47.854 | 50.623 | 47.697 | 43.585 | 36.738 | Continuing | Continuing |
| 3230: *Information Assurance* | 14.376 | 2.120 | 1.523 | 2.415 | - | 2.415 | 2.390 | 2.230 | 2.274 | 2.318 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Information Systems Security Program (ISSP) ensures the protection of Navy and joint cyberspace systems from exploitation and attack. The ISSP will extend cybersecurity and resiliency by addressing the acquisition and modernization of our platforms, systems, and information technology networks; by instituting quality assurance programs to protect critical warfighting capabilities to sustain the readiness of our cyber programs and systems. The ISSP cyberspace programs include wired and wireless telecommunications systems, Information Technology (IT) systems, and the content processed, stored, or transmitted therein. Cyberspace operations include both defensive and offensive measures, which preserve the ability to utilize friendly cyberspace capabilities; protect data, networks, net-centric capabilities, and other designated systems; and project power by the application of force in or through cyberspace. An attack, via cyberspace, targets an enterprise's use of cyberspace for the purpose of disrupting, disabling, destroying, or maliciously controlling a computing environment/infrastructure; or destroying the integrity of the data or stealing controlled information. The ISSP includes the protection of the Navy's National Security Systems and Information (NSSI). The ISSP must be rapid, predictive, adaptive, and tightly coupled to cyberspace technology. The ISSP provides architectures, products, and services based on mission impacts, cybersecurity threats, information criticality, vulnerabilities, and required defensive countermeasure capabilities.

The ISSP focuses on efforts that address the risk management of cyberspace, which provides capabilities to protect, detect, restore and respond. The ISSP provides the Navy with the following cybersecurity elements: (1) defense of NSSI, including the Nuclear Command, Control, and Communications, Navy (NC3-N) system, naval weapons systems, critical naval infrastructure for Command, Control, Communications, Computers, & Intelligence (C4I) afloat and shore networks, joint time and navigation systems, and industrial control systems, using modern cryptographic solutions and cyber security tools; (2) technologies supporting the Navy's Computer Network Defense (CND) service provider that will accelerate the Navy's ability to prevent, constrain, and mitigate cyber attacks and critical vulnerabilities; (3) Navy Cyber Situational Awareness (NCSA) technologies that will provide greatly improved cyber threat intelligence and situational awareness, from external boundaries to tactical edge infrastructures; (4) assurance of the Navy's Crypto telecommunications infrastructure and the wireless spectrum; (5) sensing cyber threats across all Navy shore and afloat networks to reduce the complexities of monitoring, assessing, and detecting adversary activities across multiple enclaves through the collection of tools in SHARKCAGE; (6) alignment to Navy's Insider Threat program; (7) assurance of joint-user cyberspace domains, using a Defense-In-Depth (DiD) security architecture and its alignment with the Joint Information Environment (JIE)/Joint Regional Security Stack (JRSS); (8) assurance technologies, including the Key Management (KM) and Public Key Infrastructure (PKI).

FY18 increase aligns to the following capabilities in support of National Defense due to recent cybersecurity threats:

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303140N *I Information Sys Security Program* |

(1) Modernize Navy Cryptography common software for Transmission Security (TRANSEC), including the KGV-11M crypto core, based on the THORNTON TRANSEC Algorithm Modernization (TTAM). Specification algorithm modernization is mandated by Chairman of the Joint Chiefs of Staff Instruction (CJCSN) 6510 to meet mandated National Security Agency (NSA) cease key dates. The TRANSEC algorithm modernization mandate protects critical UHF circuits from unauthorized access, spoofing, and denial of service.

(2) Accelerate SHARKCAGE development efforts to provide Defensive Cyberspace Operations (DCO) forces with the ability to detect adversary activities and analyze cyber attacks against Navy networks via protected, isolated networks, and integrate intelligence and Navy data to assess potential cyber threats. DCO are passive and active cyberspace defense activities that allow us to outmaneuver an adversary. SHARKCAGE will provide the capability to analyze active cyber threats and take actions to contain/stop threat activities. The data that is collected and analyzed via SHARKCAGE will be presented and visualized via the NCSA capability.

(3) Accelerate NCSA development activities that provide Navy forces near real-time cyber risk and readiness information of Navy networks and their associated mission impacts across the Navy enterprise as an enabler of assured Command and Control (C2). NCSA will also be able to receive cyber threat analysis from SHARKCAGE. As a result, operational level of war cyber situational awareness will be provided to Fleet Cyber Command (FCC) and Navy Geographic Maritime Operations Centers (MOC) through visualization capabilities via web-accessible cyber Common Operational Pictures (COP) established through the correlation of relevant cyber data sources; combining asset data, baseline configuration data, event data, and real-time threat data critical for defending Navy networks and Navy network infrastructure.

(4) Increase in Information Assurance supports investment in efforts to improve effectiveness of cyber defenses and critical infrastructure protection, and adequately fund continuing efforts. Increased investment in cyber defense includes programs addressing asset criticality and management and a new generation of cross-domain technology that focuses on critical infrastructure protection.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 28.081 | 38.510 | 39.701 | - | 39.701 |
| Current President's Budget | 29.491 | 38.510 | 50.269 | - | 50.269 |
| Total Adjustments | 1.410 | 0.000 | 10.568 | - | 10.568 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 2.002 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.592 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 9.643 | - | 9.643 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.925 | - | 0.925 |

**Change Summary Explanation**

TECHNICAL:

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303140N *I Information Sys Security Program* |

Computer Network Defense (CND):
- Begin development, integration, and testing of Navy's Insider Threat program capabilities in order to fulfill the Presidential, Department of Defense (DoD), and Department of Navy (DoN) directives to reduce the risk of Insider Threats as well as provide enhancements to the Vulnerability Remediation Asset Manager (VRAM) to improve DoD cyber readiness.

Navy Cryptography (Crypto):
- Modernize KGV-11 to support National Security Agency (NSA) mandated cryptographic modernization, which provides for secure access to the Ultra High Frequency (UHF) Demand Assigned Multiple Access (DAMA) network.

Key Management (KM):
- Key Management Infrastructure (KMI) Capability Increment (CI)-2 Spiral 2/Spin 4 capabilities has been programmatically realigned from KMI CI-2 to KMI CI-3 per NSA.

SHARKCAGE & Navy Cyber Situational Awareness (NCSA):
- SHARKCAGE and NCSA development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.

SCHEDULE:

CND:
- Due to the dynamic nature of cybersecurity and increasing complexity of technology CND builds were adjusted to include various cybersecurity/remediation capabilities to include Joint Regional Security Stack (JRSS), the Navy's Insider Threat Program as well as cybersecurity enhancements to the VRAM capability to improve DoD cyber readiness.

Crypto:
- VINSON/Advanced Narrowband Digital Voice Terminal (ANDVT) Cryptographic Modernization (VACM) Full Rate Production (FRP) decision was achieved in 3QFY16 in accordance with the revised United States Air Force (USAF) schedule.

- VACM Initial Operational Capability (IOC) accelerated from 4QFY16 to 3QFY16 due to the installations of operational Low Rate Initial Production (LRIP) devices on Nuclear Command, Control, and Communications, Navy (NC3-N) circuits and was achieved in 3QFY16.

- Transmission Security (TRANSEC) studies and analysis completion accelerated from 4QFY16 to 2QFY16 to prepare for NSA release of THORNTON TRANSEC Algorithm Modernization (TTAM) specifications in 3QFY16.

- TRANSEC Development and Product Testing extended from 4QFY19 to 3QFY20 to meet fielding requirements in accordance with national mandates.

- Advanced Cryptographic Capability (ACC) Solutions Development and Product Tests extended from 4QFY19 to 4QFY22 to meet fielding requirements in accordance with national mandates.

- KGV-11M key milestones added in accordance with the development schedule to support NSA mandated cryptographic modernization.

KM:
- KMI CI-2 Development updated to reflect development of Spiral 1 though Spiral 3 in accordance with NSA's schedule.

- KMI CI-2 Spiral 2 Spin 2 Fielding Decision (FD) updated from 4QFY16 to 4QFY17 in accordance with NSA's schedule.

- KMI CI-2 Spiral 2 Spin 3 FD removed in accordance with NSA's schedule.

- KMI CI-2 Spiral 2 Spin 4 Developmental Testing (DT), Operational Assessment (OA), and FD removed in accordance with NSA's schedule. KMI CI-2 Spiral 2 Spin 4 capability has been programmatically realigned from KMI CI-2 to KMI CI-3.

- KMI CI-2 Spiral 2 Full Deployment Decision (FDD) updated from 4QFY17 to 2QFY18 in accordance with NSA's schedule.

- KMI CI-2 Spiral 2 Spin 2, CI-2 Spiral 2 Spin 3, and CI-3 DT and OA events have been incorporated into Development, Integration, and Test cycles.

SHARKCAGE & NCSA:
- SHARKCAGE and NCSA development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.

- SHARKCAGE and NCSA are planned Rapid Deployment Capability's (RDC). An RDC is the Navy's implementation of the Department of Defense (DoD) 5000 defined "Accelerated Acquisition Program." It provides the ability to react immediately to a newly discovered enemy threat(s) or potential enemy threat(s) through tailored procedures, to allow for fielding of mature capabilities based on Commercial Off-The-Shelf (COTS) and Non-Developmental Item (NDI) products within a two year period. At the end of that period SHARKCAGE and NCSA are planned to transition to respective ACAT programs.

FUNDING:

CND:
- SHARKCAGE and NCSA development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.

- Additional funding provided for cybersecurity enhancements for VRAM to improve DoD cyber readiness.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0303140N *I Information Sys Security Program* |

Crypto:
- Increase in FY18 will develop and implement common software for TRANSEC modernization, including the KGV-11M crypto core, based on the TTAM. Specification algorithm modernization is mandated by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 to meet mandated NSA cease key dates. The TRANSEC algorithm modernization mandate protects critical UHF circuits from unauthorized access, spoofing, and denial of service.

SHARKCAGE:
- SHARKCAGE development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.

- Increase in FY18 will accelerate SHARKCAGE development efforts to provide Defensive Cyberspace Operations (DCO) forces with the ability to detect adversary activities and analyze cyber attacks against Navy networks via protected, isolated networks, and integrate intelligence and Navy data to assess potential cyber threats. SHARKCAGE will provide the capability to analyze active cyber threats and take actions to contain/stop threat activities. The data that is collected and analyzed via SHARKCAGE will be presented and visualized via the NCSA capability.

NCSA:
- NCSA development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.

- Increase in FY18 will accelerate NCSA development activities that provide Navy forces near real-time cyber risk and readiness information of Navy networks and their associated mission impacts across the Navy enterprise as an enabler of assured Command and Control (C2). NCSA will be able to receive cyber threat analysis from SHARKCAGE. As a result, operational level of war cyber situational awareness will be provided to Fleet Cyber Command (FCC) and Navy Geographic Maritime Operations Centers (MOC) through visualization capabilities via web-accessible cyber Common Operational Pictures (COP) established through the correlation of relevant cyber data sources; combining asset data, baseline configuration data, event data, and real-time threat data critical for defending Navy networks and Navy network infrastructure.

The FY 2018 funding request was reduced by $2.313 million to account for the availability of prior year execution balances.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0303140N / *Information Sys Security Program* | | | | Project (Number/Name)<br>0734 / *Communications Security R&D* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 0734: *Communications Security R&D* | 378.730 | 27.371 | 36.987 | 47.854 | - | 47.854 | 50.623 | 47.697 | 43.585 | 36.738 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Information Systems Security Program (ISSP) Research Development Test & Evaluation (RDT&E) efforts extend our cybersecurity and resiliency, provide Defensive Cyberspace Operations (DCO), and cross domain solutions to protect data, Department of Defense information networks (DoDIN), net-centric operations, the forward deployed, and other designated systems in order to protect cyberspace and critical warfighting capabilities.

This project includes a rapidly evolving design and application engineering effort to modernize cryptographic equipment and ancillaries with state-of-the-art replacements to counter evolving and increasingly sophisticated threats. Communications Security (COMSEC) and Transmission Security (TRANSEC) are evolving from stand-alone, dedicated devices to embedded modules incorporating National Security Agency (NSA) approved cryptographic engines, loaded with the certified algorithms and keys, and interconnected via industry-defined interfaces. This includes the Department of Defense (DoD) Information Network (DoDIN) capability requirements document for the development of Content Based Encryption (CBE).

Computer Network Defense (CND): The CND program provides cyberspace capabilities to secure the Cyber Domain. CND is a combination of hardware, software, sets of processes and protective measures that use computer networks to detect, monitor, protect, analyze and defend against network infiltrations resulting in service/ network denial, degradation and disruptions. CND enables a government or military institute/organization to defend against network attacks perpetrated by malicious or adversarial computer systems or networks.

Navy Cryptography (Crypto): Navy Crypto modernizes legacy cryptographic equipment which includes families of COMSEC and TRANSEC devices that are divided into crypto voice, crypto data, crypto products and associated ancillary devices. These devices provide modern cryptographic solutions to replace obsolete, legacy devices within the crypto categories.

Key Management (KM): KM monitors and tracks capability verification testing, as well as designs and tests capabilities to provide a net-centric, web based architecture for the ordering, management and distribution of all cryptographic key material to support Navy users, to include integration of Intermediary Application (iApp).

Public Key Infrastructure (PKI): The DoD PKI program, under the authority of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD AT&L), develops and tests PKI equipment and is responsible for meeting statutory and regulatory requirements for the DoD PKI program. The Navy PKI program tests and implements products for afloat and shore non-Navy Marine Corps Intranet (NMCI) networks and institutionalizes Identity and Access Management (IdAM) so that person and non-person entities can securely access all authorized DoD resources.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

SHARKCAGE: SHARKCAGE is a global, federated DCO enclave consisting of shore sensor nodes, DCO analysis workbenches, and analytic nodes. Utilizing one-way passive taps in a protected, isolated, classified environment, SHARKCAGE consolidates cyber event data from multiple platforms and networks, providing Navy DCO forces with a shared environment and common platform for integrated workflow, collaboration, and analysis. SHARKCAGE efficiently detects, correlates, and analyzes nation and non-nation state attacks against maritime Navy networks and the Naval Networking Environment (NNE).

Navy Cyber Situational Awareness (NCSA): NCSA is a command and control infrastructure that provides Navy commanders with timely, trusted, and comprehensive Situational Awareness (SA) of the cyberspace domain to include tailored, near real-time visualization of network health, vulnerabilities, and operational readiness through the correlation of data from multiple sources. NCSA combines asset data, baseline configuration data, and real-time threat data - critical for defending a fully-interconnected network infrastructure. NCSA enables early threat detection and timely decision making.

Cybersecurity Services: Cybersecurity Services develop cyber architecture and provides cybersecurity engineering for the DoD and Department of the Navy (DoN) cybersecurity interests based on the requirements prioritized by Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F). Cybersecurity Services transitions new technologies to address current Navy cybersecurity challenges.

The ISSP focuses on efforts that address the risk management of cyberspace, which provides capabilities to protect, detect, restore and respond. The ISSP provides the Navy with the following cybersecurity elements: (1) defense of National Security Systems and Information (NSSI), including the Nuclear Command, Control, and Communications, Navy (NC3-N) system, naval weapons systems, critical naval infrastructure for Command, Control, Communications, Computers, & Intelligence (C4I) afloat and shore networks, joint time and navigation systems, and industrial control systems, using modern cryptographic solutions and cyber security tools; (2) technologies supporting the Navy's CND service provider that will accelerate the Navy's ability to prevent, constrain, and mitigate cyber attacks and critical vulnerabilities; (3) NCSA technologies that will provide greatly improved cyber threat intelligence and situational awareness, from external boundaries to tactical edge infrastructures; (4) assurance of the Navy's Crypto telecommunications infrastructure and the wireless spectrum; (5) sensing cyber threats across all Navy shore and afloat networks to reduce the complexities of monitoring, assessing, and detecting adversary activities across multiple enclaves through the collection of tools in SHARKCAGE; (6) alignment to Navy's Insider Threat program; (7) assurance of joint-user cyberspace domains, using a Defense-In-Depth (DiD) security architecture and its alignment with the Joint Information Environment (JIE)/Joint Regional Security Stack (JRSS); (8) assurance technologies, including KM and PKI.

FY18 increase aligns to the following capabilities in support of National Defense due to recent cybersecurity threats:

(1) Modernize Navy Cryptography common software for Transmission Security (TRANSEC), including the KGV-11M crypto core, based on the THORNTON TRANSEC Algorithm Modernization (TTAM). Specification algorithm modernization is mandated by Chairman of the Joint Chiefs of Staff Instruction (CJCSN) 6510 to meet mandated National Security Agency (NSA) cease key dates. The TRANSEC algorithm modernization mandate protects critical UHF circuits from unauthorized access, spoofing, and denial of service.

(2) Accelerate SHARKCAGE development efforts to provide DCO forces with the ability to detect adversary activities and analyze cyber attacks against Navy networks via protected, isolated networks, and integrate intelligence and Navy data to assess potential cyber threats. DCO are passive and active cyberspace defense activities

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that allow us to outmaneuver an adversary. SHARKCAGE will provide the capability to analyze active cyber threats and take actions to contain/stop threat activities. The data that is collected and analyzed via SHARKCAGE will be presented and visualized via the NCSA capability.

(3) Accelerate NCSA development activities that provide Navy forces near real-time cyber risk and readiness information of Navy networks and their associated mission impacts across the Navy enterprise as an enabler of assured Command and Control (C2). NCSA will also be able to receive cyber threat analysis from SHARKCAGE. As a result, operational level of war cyber situational awareness will be provided to FCC and Navy Geographic Maritime Operations Centers (MOC) through visualization capabilities via web-accessible cyber Common Operational Pictures (COP) established through the correlation of relevant cyber data sources; combining asset data, baseline configuration data, event data, and real-time threat data critical for defending Navy networks and Navy network infrastructure.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Computer Network Defense (CND) | 17.290 | 24.190 | 14.039 | 0.000 | 14.039 |
| ***Articles:*** | - | - | - | - | - |

***FY 2016 Accomplishments:***
Continued to develop Task Force Cyber Awakening (TFCA), specifically Navy Cyber Situational Awareness (NCSA) and Operation Rolling Tide (ORT)/Cyber Remediation initiatives. Funding provided additional capabilities within the Navy's Computer Network Defense (CND) program in order to accelerate advanced cybersecurity initiatives to achieve improved network defense and security wholeness. Additional capabilities included network vulnerability remediation, security compliance reporting, mapping of Navy networks in order to automate real time cybersecurity capabilities critical to the warfighter and to support Command and Control (C2) of Cyber by providing a Data-as-a-Service capability to monitor the cyber environment (CE) by ingesting data from numerous data feeds then plan and direct kinetic/non-kinetic operations within the CE. Continued to develop, integrate, and test CND Builds, Defense-in-Depth (DiD) and Situational Awareness (SA) technologies for knowledge-empowered CND operations for shore sites and afloat platforms. Continued to develop new capabilities for the Navy's C2 architecture and provide technical guidance to ensure CND requirements are met by Consolidated Afloat Networks and Enterprise Services (CANES). Continued to implement Department of Defense (DoD) and United States Cyber Command (USCC) cybersecurity tools and mandates into ONE-Net and Command, Control, Communications, Computers and Intelligence (C4I) networks. Continued to evaluate needs derived from stakeholders and the CND Capabilities Steering Group (CCSG), and developed, updated, and integrated CND suites. Provided Vulnerability Remediation Asset Manager (VRAM) tool to include Online Compliance Reporting System (OCRS) and Continuous Monitoring Risk Score (CMRS) capabilities. Continued to develop and implement an optimal technical and governance solution for interception of outbound encrypted traffic. Continued integration and testing of Secure Socket Layer (SSL) intercept to achieve compliance with DISA firewall security guidance. Furthered efforts to virtualize CND capabilities and consolidate cybersecurity services in the ONE-Net environment. Continued analysis to replace and assume acquisition management of

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Navy Cyber Defense Operations Command's (NCDOC) tactical sensor infrastructure. Continued to support Fleet Cyber Command / Commander Tenth Fleet's (FCC/C10F) NCSA efforts by deploying integrated tools at the C10F Maritime Operations Center (MOC) to support C2 of the communications systems. Continue to develop Joint Capability Technology Demonstration (JCTD) Virtual Secure Enclave (VSE) to segment networks and adaptively manage operational risks. | | | | | |
| ***FY 2017 Plans:***<br>Continue to develop Navy's portion of the Nuclear Command, Control, and Communications, Navy (NC3-N) and Ballistic Missile Defense (BMD) cyber security system of systems; Navy Cyber Situational Awareness (NCSA) Common Operational Picture and other analytic development for NC3-N; Development of SHARKCAGE, which provides the mechanisms to sense cyber threats across all Navy shore and afloat networks to reduce the complexities of monitoring, assessing, and detecting adversary activities across multiple enclaves (e.g. Non-classified Internet Protocol (IP) Router Network (NIPRNet), Secret Internet Protocol Router Network (SIPRNet), C4I, Combat Systems, Hull Mechanical & Electrical (HM&E), etc.). Additionally, funding was for the development of event collection/analysis components for shore nodes and flyaway kits for deployed Cyber Protection Teams (CPT). Complete development and engineering efforts on ORT/Cyber Remediation initiatives. Continue to support C10F NCSA initiatives through the deployment of integrated Cyber SA tools that enhance C10F MOC ability to support/administer C2 of Navy networks and communication systems within Cyber Key Terrain (CKT) domain(s). Continue to develop, integrate, and test CND Inc 2 Builds, DiD, and SA technologies for knowledge-empowered CND operations for shore sites and afloat platforms within Navy's ONE-Net and C4I networks to achieve improved network defense and security wholeness. Continue to evaluate needs derived from stakeholders and the CCSG, and develop, update, and integrate CND suites. Continue to provide technical guidance to support deployment of new CND capabilities by CANES. Continue integration and testing of SSL intercept to achieve compliance with DISA firewall security guidance. Continue to implement DoD and USCC cybersecurity tools and mandates into ONE-Net and C4I networks. Continue efforts to further virtualize CND capabilities for more effective and cost-efficient deployment of cybersecurity technologies. Continue enhancing the VRAM tool per FCC/C10F reporting requirements. Continue development and implementation of an optimal technical and governance solution for interception of outbound encrypted traffic. Continue to develop, integrate, and test solution to replace and assume acquisition management of NCDOC tactical sensor infrastructure. Continue to develop JCTD VSE to segment networks and adaptively manage operational risks. | | | | | |
| ***FY 2018 Base Plans:***<br>SHARKCAGE and NCSA development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity. | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue to develop Navy's portion of the NC3-N and BMD cyber security system of systems within the CND architecture. Continue to develop, integrate, and test CND Inc 2 Builds, DiD, and SA technologies for knowledge-empowered CND operations for shore sites and afloat platforms within Navy's ONE-Net and C4I networks to achieve improved network defense and security wholeness. Continue enhancing the VRAM tool per FCC/C10F and Naval Information Forces (NAVIFOR) requirements, to include Security Technical Implementation Guides (STIG) Reporting Integration, web services to share data between VRAM, cyber readiness databases and mission support systems to improve DoD cyber readiness. Continue to evaluate needs derived from stakeholders and the CCSG, and correspondingly develop, update, and integrate CND suites. Continue to implement DoD and USCC cybersecurity tools and mandates into ONE-Net and C4I networks. Continue to provide technical guidance to support CANES deployment of new CND capabilities. Begin to optimize CND suite for alignment with Joint Regional Security Stack (JRSS), including the transition of some capabilities from the CND suite into JRSS. Continue efforts to further virtualize CND capabilities for more effective and cost-efficient deployment of cybersecurity technologies. Continue to develop, integrate, and test solution to replace and assume acquisition management of NCDOC's tactical sensor infrastructure. Begin development and alignment to Navy's Insider Threat program to identify possible insider threats across multiple enclaves in order to fulfill the Presidential, DoD, and Department of Navy (DoN) directives.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Navy Cryptography (Crypto) | 5.414 | 7.642 | 11.912 | 0.000 | 11.912 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Completed Transmission Security (TRANSEC) studies and analysis, delivered Analysis of Alternatives (AoA) replacement products, initiated development efforts to modernize legacy devices, and initiated developmental testing. Continued to provide development and security engineering for modernization of Department of the Navy (DoN) crypto systems and embeddable crypto modernization strategies. Continued to work with National Security Agency (NSA) on certification authority, acquisition authority and data testing for all crypto modernization efforts. Continued to investigate impacts of upcoming NSA security enhancements for crypto modernization products. Initiated Advanced Cryptographic Capabilities (ACC) solutions development and testing across multiple products. Achieved VINSON/Advanced Narrowband Digital Voice Terminal (VACM) Full Rate | | | | | |

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| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Production (FRP) decision. Achieved VACM Initial Operational Capability (IOC). Continued modernization of VACM ancillary devices.<br><br>***FY 2017 Plans:***<br>Accelerate TRANSEC replacement product development and continue developmental testing. Continue to provide development and security engineering for modernization of DoN crypto systems and embeddable crypto modernization strategies. Continue to work with NSA on certification authority, acquisition authority and data testing for all crypto modernization efforts. Continue to investigate impacts of upcoming NSA security enhancements for crypto modernization products. Continue ACC solutions development and testing across multiple products. Continue modernization of VACM ancillary devices. Develop Navy strategy and implementation plan to modernize secure voice architectures within Navy networks.<br><br>***FY 2018 Base Plans:***<br>Increase in FY18 will modernize common software for Transmission Security (TRANSEC), including the KGV-11M crypto core, based on the THORNTON TRANSEC Algorithm Modernization (TTAM). Specification algorithm modernization is mandated by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 to meet mandated NSA cease key dates. The TRANSEC algorithm modernization mandate protects critical UHF circuits from unauthorized access, spoofing, and denial of service. Complete contract award for development of KGV-11M TRANSEC End Cryptographic Units (ECU). Develop a transition plan for TRANSEC and ACC-based devices to support crypto modernization. Continue TRANSEC replacement product development and continue developmental testing, focusing on the KGV-11M device. Continue to provide development and security engineering for modernization of DoN crypto systems and embeddable crypto modernization strategies. Continue to work with NSA on certification authority, acquisition authority and data testing for all crypto modernization efforts. Continue to investigate impacts of upcoming NSA security enhancements for crypto modernization products. Continue ACC solutions development and testing across multiple products. Conduct test and evaluation on new software capabilities for crypto modernization products. Continue modernization of VACM ancillary devices. Continue to develop Navy strategy and implementation plan to modernize secure voice architectures within Navy networks.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Key Management (KM) | 2.229 | 2.363 | 2.230 | 0.000 | 2.230 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continued Key Management Infrastructure (KMI) Capability Increment (CI)-2 Spiral 2/Spin 2 verification testing to include vendor Development Testing (DT) and Operational Assessment (OA). Completed Spiral 2/Spin 3 capability engineering and development. Continued to define capability requirements for KMI CI-3 and KMI Tech Refresh. Continued migrating Communications Security (COMSEC) Management Workstation (CMWS) and the follow on to Simple Key Loader (SKL) into the KMI environment. Continued the development, engineering, and testing of the Intermediary Application (iApp) which enhances the accounting for and distribution of KMI key delivery.<br>***FY 2017 Plans:***<br>Achieve KMI CI-2 Spiral 2/Spin 2 fielding Decision (FD). Continue verification testing to include vendor DT and OA in support of KMI CI-2 Spiral 2/Spin 3. Continue to define capability requirements for KMI CI-3. Continue migrating CMWS and the follow on to SKL into the KMI environment. Continue the development, engineering, and testing of iApp, which will enhance the accounting for and distribution of KMI key delivery. Complete the development, engineering and testing of KMI Tech Refresh.<br>***FY 2018 Base Plans:***<br>Achieve Full Operational Test & Evaluation (FOT&E) and Full Deployment Decision (FDD) for KMI Spiral 2. Continue migrating COMSEC CMWS and the follow on to SKL into the KMI environment. Initiate the development, engineering, and testing of KMI CI-3, including the integration of the iApp within a network environment, which will enhance the accounting for and distribution of KMI key delivery.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Public Key Infrastructure (PKI) | 0.354 | 0.350 | 0.360 | 0.000 | 0.360 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued Navy compliance and compatibility with Department of Defense (DoD) Public Key Infrastructure (PKI) implementation, cryptographic algorithms and development efforts, to include Computer Network Defense (CND), Elliptic Curve Cryptography (ECC), Secure Hash Algorithms (SHA-256), Navy Certificate Validation Infrastructure (NCVI), Common Access Card (CAC), Alternate Logon Token (ALT), and Secret Internet Protocol Router Network (SIPRNet) Token. Continued research, test and evaluation of the Non-classified Internet Protocol Router Network (NIPRNet) Enterprise Alternate Token System (NEATS), and continue researching tools to support certificates for Non-Person Entity (NPE). Continued researching and testing PKI authentication capabilities to support mobile devices, Identity and Access Management (IdAM) in tactical/austere environments, | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| increased information security and began Real-time Automated Personnel Identification System (RAPIDS) Operating Systems (OS) testing.<br>***FY 2017 Plans:***<br>Continue Navy compliance and compatibility with DoD PKI implementation, cryptographic algorithms and development efforts, to include CND, ECC, SHA-256 and other encryption methodologies, NCVI, CAC, ALT, and SIPRNet Token. Continue research, test and evaluation of NEATS, NPE, PKI authentication capabilities to support mobile devices, IdAM technologies, and RAPIDS OS.<br>***FY 2018 Base Plans:***<br>Continue Navy compliance and compatibility with DoD PKI implementation, cryptographic algorithms and development efforts, to include CND, ECC, SHA-256 and other encryption methodologies, NCVI, CAC, ALT, and SIPRNet Token. Continue research, test and evaluation of NEATS, NPE, PKI authentication capabilities to support mobile devices, IdAM technologies, and RAPIDS OS.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** SHARKCAGE<br>***Articles:*** | 0.000<br>- | 0.000<br>- | 8.973<br>- | 0.000<br>- | 8.973<br>- |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>SHARKCAGE development efforts were previously budgeted under Computer Network Defense (CND); funding broken out for greater visibility into cybersecurity.<br><br>Increase in FY18 will accelerate SHARKCAGE development efforts to provide Defensive Cyber Operations (DCO) forces with the ability to detect adversary activities and analyze cyber attacks against Navy networks via protected, isolated networks, and integrate intelligence and Navy data to assess potential cyber threats. SHARKCAGE will provide the capability to analyze active cyber threats and take actions to contain/stop threat activities. The data that is collected and analyzed via SHARKCAGE is presented and visualized via the Navy Cyber Situational Awareness (NCSA) capability. Continue development of SHARKCAGE DCO enclave to | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| address new requirements from the fleet in light of emerging threats in the tactical environment. Development efforts include network taps, sensors, and analytic toolsets for passively monitoring multiple Navy shore and afloat networks and enclaves (e.g., Command, Control, Communications, Computers and Intelligence (C4I) networks, Combat Systems (CS), Hull, Mechanical, and Electrical (HM&E), etc.) to detect and assess cyber threats across multiple security enclaves. Continue development of event collection and analysis components for shore sensor nodes and afloat flyaway kits for deployed Cyber Protection Teams (CPT).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Navy Cyber Situational Awareness (NCSA)<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>Navy Cyber Situational Awareness (NCSA) development efforts were previously budgeted under Computer Network Defense (CND); funding broken out for greater visibility into cybersecurity.<br><br>Increase in FY18 will accelerate NCSA development activities that provide Navy forces near real-time cyber risk and readiness information of Navy networks and their associated mission impacts across the Navy enterprise as an enabler of assured Command and Control (C2). NCSA receives cyber threat analysis from SHARKCAGE. As a result, operational level of war cyber situational awareness will be provided to Fleet Cyber Command (FCC) and Navy Geographic Maritime Operations Centers (MOC) through visualization capabilities via web-accessible cyber Common Operational Pictures (COP) established through the correlation of relevant cyber data sources; combining asset data, baseline configuration data, event data, and real-time threat data critical for defending Navy networks and Navy network infrastructure. Continue development and maturation of NCSA capabilities to address new requirements from the fleet in light of emerging threats in the tactical environment. Development efforts will include the integration of all-source intelligence with Navy maritime data to enable early threat detection, and assessment of adversary activities and capabilities, intent, and access to critical Navy networks. NCSA development efforts will provide a shared and tailorable Maritime Cyber "Integrated" COP external to FCC/C10F beginning with Commander, Pacific Fleet (COMPACFLT) MOC to enable assessments | 0.000<br>- | 0.000<br>- | 7.840<br>- | 0.000<br>- | 7.840<br>- |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| of cyber vulnerabilities, threats, and risks relative to Ballistic Missile Defense (BMD) and Nuclear Command, Control, and Communications, Navy (NC3-N) missions. NCSA's maturation will provide for monitoring of relevant and current Navy networks providing near real-time visualization and analytics of the cyberspace domain.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Cybersecurity Services | 2.084 | 2.442 | 2.500 | 0.000 | 2.500 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued to provide security systems engineering support for the development of Department of Defense (DoD) and Department of the Navy (DoN) cybersecurity architectures and the transition of new technologies to address Navy cybersecurity challenges. Continued to provide updates to reflect emerging priorities and address Navy specific threats. Continued to coordinate cybersecurity activities across the virtual System Command (SYSCOM) via the Cybersecurity Trusted Architecture (TA) to ensure the security design and integration of cybersecurity products and services is consistent across the Navy for major initiatives such as the future afloat, ashore, and Outside of the Continental United States (OCONUS) networks. Continued to provide cybersecurity risk analysis and recommended risk mitigation strategies for Navy critical networks and Command, Control, Communications, Computers and Intelligence (C4I) systems. Continued to coordinate with the Navy acquisition community to ensure cybersecurity requirements are identified and addressed within the development cycles for emerging Navy network and C4I capabilities. Continued to evaluate products for security issues and develop guidance and procedures for the design and integration of risk mitigation strategies via appropriate cybersecurity controls.<br>***FY 2017 Plans:***<br>Begin coordination with Joint Information Environment (JIE) (e.g., Joint Regional Security Stack (JRSS), Joint Management System (JMS), etc.) to ensure Navy architecture requirements for tactical networks are met. Continue to provide security systems engineering support for the development of DoD and DoN cybersecurity architectures and the transition of new technologies to address Navy cybersecurity challenges. Continue to provide updates to reflect emerging priorities and address Navy specific threats. Continue to coordinate cybersecurity activities across the virtual SYSCOM via the Cybersecurity TA to ensure the security design and integration of cybersecurity products and services is consistent across the Navy for major initiatives such as the future afloat, ashore, and OCONUS networks. Continue to provide cybersecurity risk analysis and recommended risk mitigation strategies for Navy critical networks and C4I systems. Continue to coordinate with the Navy acquisition community to ensure cybersecurity requirements are identified and addressed within the | | | | | |

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| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| development cycles for emerging Navy network and C4I capabilities. Continue to evaluate products for security issues and develop guidance and procedures for the design and integration of risk mitigation strategies via appropriate cybersecurity controls.<br>***FY 2018 Base Plans:***<br>Continue coordination and alignment with JIE (e.g., JRSS, JMS, etc.) to ensure Navy architecture requirements for tactical networks are met. Continue to provide security systems engineering support for the development of DoD and DoN cybersecurity architectures and the transition of new technologies to address Navy cybersecurity challenges. Continue to provide updates to reflect emerging priorities and address Navy specific threats. Continue to coordinate cybersecurity activities across the virtual SYSCOM via the Cybersecurity TA to ensure the security design and integration of cybersecurity products and services is consistent across the Navy for major initiatives such as the future afloat, ashore, and OCONUS networks. Continue to provide cybersecurity risk analysis and recommended risk mitigation strategies for Navy critical networks and C4I systems. Continue to coordinate with the Navy acquisition community to ensure cybersecurity requirements are identified and addressed within the development cycles for emerging Navy network and C4I capabilities. Continue to evaluate products for security issues and develop guidance and procedures for the design and integration of risk mitigation strategies via appropriate cybersecurity controls.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 27.371 | 36.987 | 47.854 | 0.000 | 47.854 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN/3415: *Info Sys Security Program (ISSP)* | 126.237 | 85.694 | 89.663 | - | 89.663 | 128.177 | 155.401 | 166.705 | 165.946 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Computer Network Defense (CND): The CND Acquisition Category (ACAT) IVT program is a layered protection strategy, which militarizes Commercial Off-The-Shelf (COTS) and integrates Government Off-The-Shelf (GOTS) hardware and software products that collectively provide an effective network security infrastructure. The rapid advancement of cyber technology requires an efficient process for updating CND tools deployed to afloat and shore platforms. Recognizing the need for future

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CND capability improvements, the CND program implements an evolutionary acquisition strategy that delivers CND capabilities in multiple builds and functionality releases that address validated requirements.

Navy Cryptography (Crypto): Modernized crypto devices will replace legacy crypto in accordance with the mandate by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 as well as the National Security Agency (NSA) planned decertification, which improves the Navy's cyber defense posture. For Advanced Cryptographic Capability (ACC) the acquisition strategy will follow the NSA direction on mandated software upgrades. The planned KGV-11M program will be led by the Navy.

Key Management (KM): Key Management Infrastructure (KMI) is a NSA-led ACAT I program. It is the next generation Electronic Key Management System (EKMS) that provides the infrastructure for management, ordering and distribution of key material as well as directly supporting the key requirements of all Crypto modernization efforts. KMI will follow an increment/spiral development strategy. The KMI program will continue to develop alternative architecture implementations for communities within the Navy to implement the Intermediary Application (iApp) as a KM solution.

Public Key Infrastructure (PKI): Department of Defense (DoD) PKI is an ACAT I program jointly led by the NSA and the Defense Information Systems Agency (DISA). The Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L) is the Milestone Decision Authority (MDA). The Navy PKI project supports the DoD-wide implementation of PKI products and services across Navy afloat, non-Navy Marine Corps Intranet (NMCI), Outside the Continental United States (OCONUS) networks and other excepted networks.

SHARKCAGE: The planned SHARKCAGE Rapid Deployment Capability (RDC) effort will integrate COTS and GOTS hardware and software products to monitor multiple Navy networks and enclaves to detect, analyze, and assess threats. SHARKCAGE will provide Navy Cyber Defense Operations Command (NCDOC), Navy Information Operations Centers (NIOC), Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F), Cyber Protection Teams (CPT), and other Computer Network Defense (CND) deployers with a global Defensive Cyberspace Operations (DCO) enclave to monitor the Naval Networking Environment (NNE) and maritime Navy networks, including Navy shore sites and afloat platforms conducting Ballistic Missile Defense (BMD) and Nuclear Command, Control, and Communications, Navy (NC3-N) missions.

Navy Cyber Situational Awareness (NCSA): The planned NCSA RDC effort will integrate COTS and GOTS hardware and software products to provide visualization of Navy networks and enclaves to analyze and assess mission threats. NCSA will be implemented via an evolutionary acquisition approach using an iterative, agile software enhancement process in the form of capability drops to address future cyber Situation Awareness (SA) capabilities and improvements required by fleet warfighters. These government-led agile software enhancements will be documented and managed through a requirements governance board process.

Cybersecurity Services: Cybersecurity Services is a Navy project, which develops cyber architecture and provides security engineering for the DoD and Department of the Navy (DoN) cybersecurity interests based on the requirements prioritized by FCC/C10F. Cybersecurity Services transitions new technologies to address current Navy cybersecurity challenges.

**E. Performance Metrics**

Computer Network Defense (CND):

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

* Provide the ability to protect from, react to, and restore operations after an intrusion or other catastrophic event through validated contingency plans for 100% of CND systems.
* Develop dynamic security defense capabilities, based on the CND posture as an active response to threat attack sensors and vulnerability indications to provide adequate defenses against subversive acts of trusted people and systems, both internal and external, by integration of anomaly-based detection solutions into the design solutions for 100% of authorized Navy enclaves.
* Defend against the unauthorized use of a host or application, particularly operating systems, by development and/or integration of host-based intrusion prevention system design solutions for 100% of authorized Navy enclaves.

Navy Cryptography (Crypto):
* Meet 100% of Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 Cryptographic Modernization (CM) requirements within the current Fiscal Year Defense Plan (FYDP) by conducting a gap analysis and building a CM roadmap and implementation plan to allow Naval Information Forces (NAVIFOR) to establish operational priorities based on risk assessments. The gap analysis is an effort to analyze current integrated legacy cryptographic devices within the Department of the Navy (DoN) inventory with known algorithm vulnerability dates, assess lifecycle sustainment issues, and identify transition device schedules, where they exist.
* Meet 100% of Top Secret (TS) and SECRET CJCSI 6510 requirements by fielding modern cryptographic devices or request "key extension" via the Joint Staff Military Command, Control, Communications, and Computers Executive Board (MC4EB).
* Increase the functionality of cryptographic devices by replacing two legacy cryptographic devices with one modern device, where possible, identify, and implement modern small form factor, multi-channel cryptography devices.

Key Management (KM):
* Meet 100% of DoN, US Coast Guard (USCG) key management requirements. USCG and Military Sealift Command (MSC) replace existing Electronic Key Management System (EKMS) Tier 2 systems with a Key Management Infrastructure (KMI) Intermediary Application (iApp). Littoral Combat Ship (LCS) implements iApp to automate key deliver to the platforms.
* Incorporate 100% of the Communication Security (COMSEC) Manager Workstation (CMWS) requirements into the iApp baseline to meet KMI Capability Increment (CI)-2 and KMI CI-3 capabilities.

Public Key Infrastructure (PKI):
* Provide integration support to ensure Navy networks and programs of record comply with Department of Defense (DoD) PKI requirements on Non-classified Internet Protocol Router Network (NIPRNet) and Secret Internet Protocol Router Network (SIPRNet), per DoD Instruction 8520.02.
* Ensure 100% interoperability with DoD and Federal partners by researching and evaluating enhanced cryptographic algorithms and DoD PKI certificate changes.

SHARKCAGE:
* Deliver a global Defensive Cyberspace Operations (DCO) enclave that conducts monitoring and analysis of network traffic and event data to detect, correlate, and assess cyber threats to the Naval Networking Environment (NNE).
* Continue to develop and enhance SHARKCAGE capabilities in order to meet the Navy Cyber Situational Awareness Urgent Operational Need (UON) as defined by Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

Navy Cyber Situational Awareness (NCSA):
* Deliver a maritime Cyber Common Operational Picture (COP) tailored to a fleet Maritime Operations Center (MOC) area of responsibility to provide operational impacts based on cyber events.
* Continue to develop and enhance NCSA capabilities in order to meet the NCSA UON as defined by FCC/C10F.

Cybersecurity Services:
* Ensure 100% interoperability and application of commercial standards compliance for ISSP products by researching and conducting selective evaluations, integrating and testing COTS/Non-Developmental Item cybersecurity products. Evaluation may include defensible network boundary capabilities such as firewalls, secure routers and switches, guards, Virtual Private Networks (VPN), and network Intrusion Prevention Systems (IPS).
* Provide 100% of the services delineated in OPNAVINST 5239.1C by serving as the Navy's cybersecurity technical lead by developing cybersecurity risk analysis and recommended risk mitigation strategies for critical Navy networks and Command, Control, Communications, Computers, and Intelligence (C4I) systems.
* Coordinate cybersecurity activities across the Navy Enterprise via the Cybersecurity Trusted Architecture (TA) to measure effectiveness of Navy networks. Ensure the security design and integration of Computer Adaptive Network Defense-in-Depth (CANDiD) products and services and that they are 100% interoperable and operationally acceptable across the Navy for major initiatives such as the future afloat, ashore, and Outside the Continental United States (OCONUS) networks.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardware Development (WR) | WR | SSC PAC : San Diego, CA | 8.975 | 1.001 | Oct 2015 | 2.232 | Oct 2016 | 2.953 | Oct 2017 | - | | 2.953 | Continuing | Continuing | Continuing |
| Hardware Development | C/CPFF | SSC PAC : San Diego, CA | 2.254 | 0.562 | Dec 2015 | 0.560 | Dec 2016 | 0.869 | Dec 2017 | - | | 0.869 | Continuing | Continuing | Continuing |
| Hardware Development (WR) | WR | SSC LANT : Charleston, SC | 4.605 | 0.200 | Oct 2015 | 0.269 | Oct 2016 | 0.570 | Oct 2017 | - | | 0.570 | Continuing | Continuing | Continuing |
| Hardware Development | C/CPFF | SSC LANT : Charleston, SC | 1.055 | 0.200 | Dec 2015 | 0.504 | Dec 2016 | 1.068 | Dec 2017 | - | | 1.068 | Continuing | Continuing | Continuing |
| Hardware Development | FFRDC | GTRI : Atlanta, GA | 0.000 | 0.000 | | 3.776 | Jan 2017 | 4.992 | Jan 2018 | - | | 4.992 | Continuing | Continuing | Continuing |
| Hardware Development | Various | Various : Various | 185.257 | 0.416 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 185.673 | - |
| Software Development (WR) | WR | SSC PAC : San Diego, CA | 12.049 | 6.149 | Oct 2015 | 6.533 | Oct 2016 | 9.781 | Oct 2017 | - | | 9.781 | Continuing | Continuing | Continuing |
| Software Development | C/CPFF | SSC PAC : San Diego, CA | 3.295 | 0.400 | Dec 2015 | 4.011 | Dec 2016 | 5.610 | Dec 2017 | - | | 5.610 | Continuing | Continuing | Continuing |
| Software Development (WR) | WR | SSC LANT : Charleston, SC | 3.550 | 0.709 | Oct 2015 | 2.253 | Oct 2016 | 2.232 | Oct 2017 | - | | 2.232 | Continuing | Continuing | Continuing |
| Software Development | C/CPFF | SSC LANT : Charleston, SC | 3.102 | 2.247 | Dec 2015 | 3.956 | Dec 2016 | 4.138 | Dec 2017 | - | | 4.138 | Continuing | Continuing | Continuing |
| Software Development | FFRDC | MITRE : McLean, VA | 0.000 | 1.371 | Nov 2015 | 1.451 | Dec 2016 | 2.022 | Dec 2017 | - | | 2.022 | Continuing | Continuing | Continuing |
| Software Development | Various | Various : Various | 66.200 | 0.537 | Dec 2015 | 0.251 | Dec 2016 | 0.532 | Dec 2017 | - | | 0.532 | Continuing | Continuing | Continuing |
| Software Development | C/CPFF | BAH : San Diego, CA | 0.000 | 3.187 | Dec 2015 | 2.539 | Jan 2017 | 2.801 | Jan 2018 | - | | 2.801 | Continuing | Continuing | Continuing |
| Software Development | FFRDC | GTRI : Atlanta, GA | 1.442 | 4.786 | Feb 2016 | 2.593 | Jan 2017 | 2.881 | Jan 2018 | - | | 2.881 | Continuing | Continuing | Continuing |
| Software Development | WR | NSMA : San Diego, CA | 0.000 | 0.805 | Mar 2016 | 1.308 | Dec 2016 | 1.631 | Dec 2017 | - | | 1.631 | Continuing | Continuing | Continuing |
| Software Development | WR | NRL : Washington DC | 0.000 | 1.260 | Nov 2015 | 0.895 | Dec 2016 | 0.903 | Dec 2017 | - | | 0.903 | Continuing | Continuing | Continuing |
| Software Development | MIPR | NSA : Fort Meade, MD | 0.000 | 1.301 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.301 | - |
| | | **Subtotal** | 291.784 | 25.131 | | 33.131 | | 42.983 | | - | | 42.983 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architecture | WR | Various : Various | 5.357 | 0.060 | Oct 2015 | 0.246 | Oct 2016 | 0.248 | Oct 2017 | - | | 0.248 | Continuing | Continuing | Continuing |
| Architecture | WR | SSC LANT : Charleston, SC | 1.246 | 0.325 | Oct 2015 | 0.458 | Oct 2016 | 0.473 | Oct 2017 | - | | 0.473 | Continuing | Continuing | Continuing |
| Studies & Design | WR | Various : Various | 5.909 | 0.150 | Jul 2016 | 0.196 | Oct 2016 | 0.415 | Oct 2017 | - | | 0.415 | Continuing | Continuing | Continuing |
| Requirements Analysis | C/CPFF | BAH : San Diego, CA | 5.494 | 0.157 | Dec 2015 | 0.196 | Oct 2016 | 0.416 | Oct 2017 | - | | 0.416 | 0.000 | 6.263 | - |
| Systems Engineering | Various | Various : Various | 3.044 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.044 | - |
| | | **Subtotal** | 21.050 | 0.692 | | 1.096 | | 1.552 | | - | | 1.552 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| System DT&E | WR | SSC PAC : San Diego, CA | 37.375 | 0.260 | Nov 2015 | 0.330 | Oct 2016 | 0.333 | Oct 2017 | - | | 0.333 | Continuing | Continuing | Continuing |
| System DT&E | WR | COTF : Norfolk, VA | 0.837 | 0.000 | | 0.470 | Dec 2016 | 0.729 | Dec 2017 | - | | 0.729 | Continuing | Continuing | Continuing |
| System DT&E | C/CPFF | BAH : San Diego, CA | 0.000 | 0.510 | Dec 2015 | 0.850 | Dec 2016 | 0.858 | Dec 2017 | - | | 0.858 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 38.212 | 0.770 | | 1.650 | | 1.920 | | - | | 1.920 | - | - | - |

**Management Services ($ in Millions)**

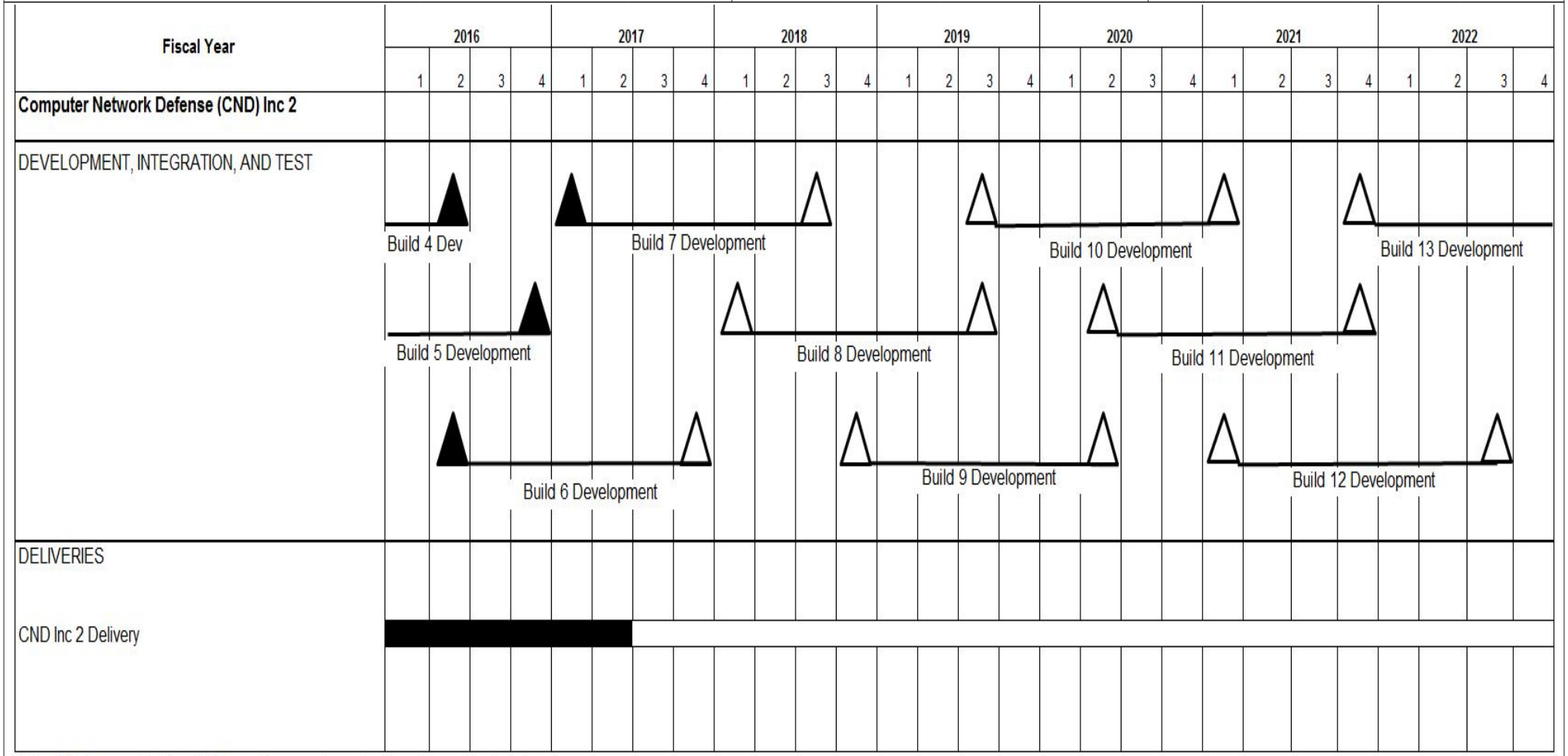
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | C/CPFF | BAH : San Diego, CA | 27.497 | 0.778 | Dec 2015 | 1.110 | Dec 2016 | 1.399 | Dec 2017 | - | | 1.399 | Continuing | Continuing | Continuing |
| Travel | WR | SPAWAR : San Diego, CA | 0.187 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.187 | - |
| | | **Subtotal** | 27.684 | 0.778 | | 1.110 | | 1.399 | | - | | 1.399 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140N / *Information Sys Security Program* | Project (Number/Name)<br>0734 / *Communications Security R&D* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 378.730 | 27.371 | | 36.987 | | 47.854 | | - | | 47.854 | - | - | - |

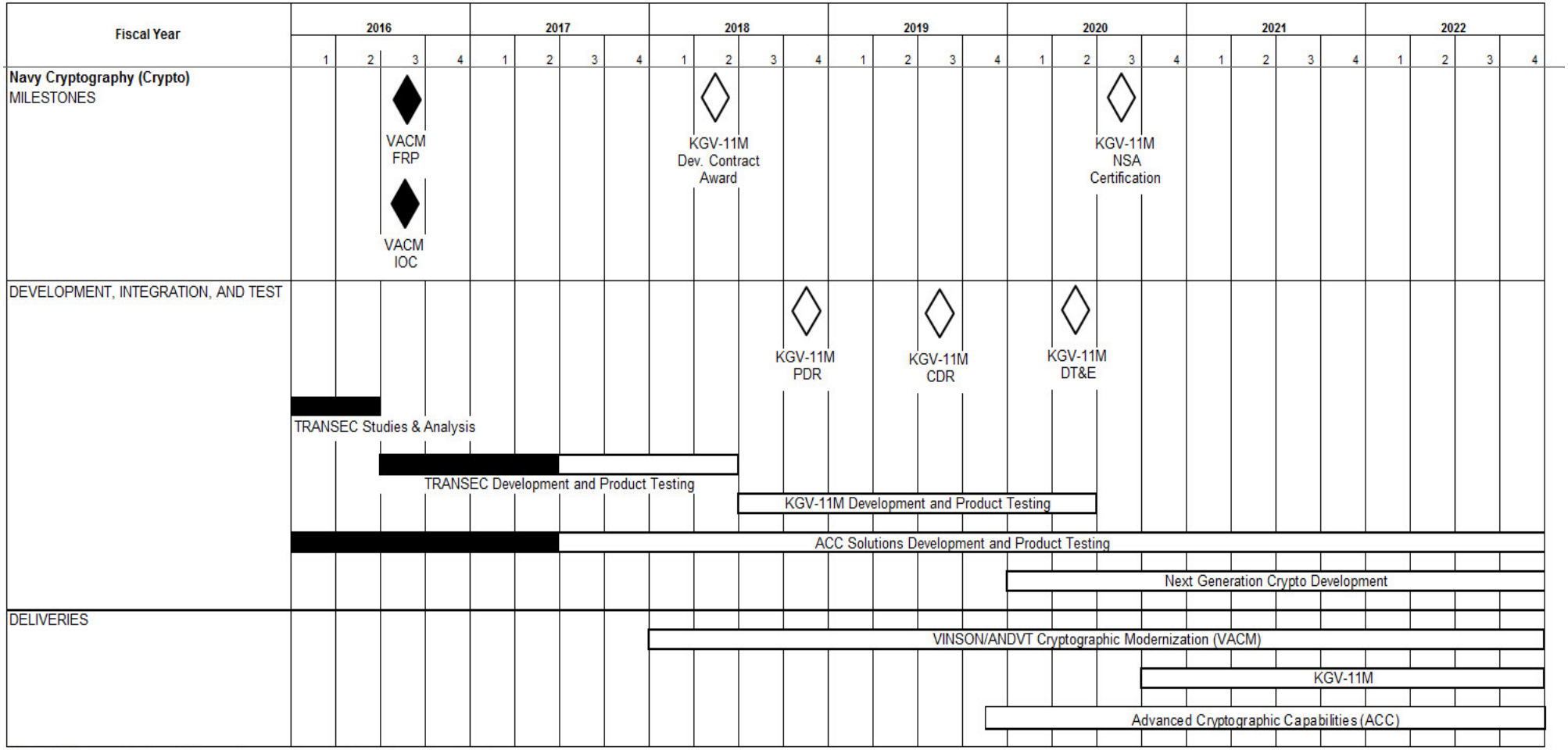
**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |



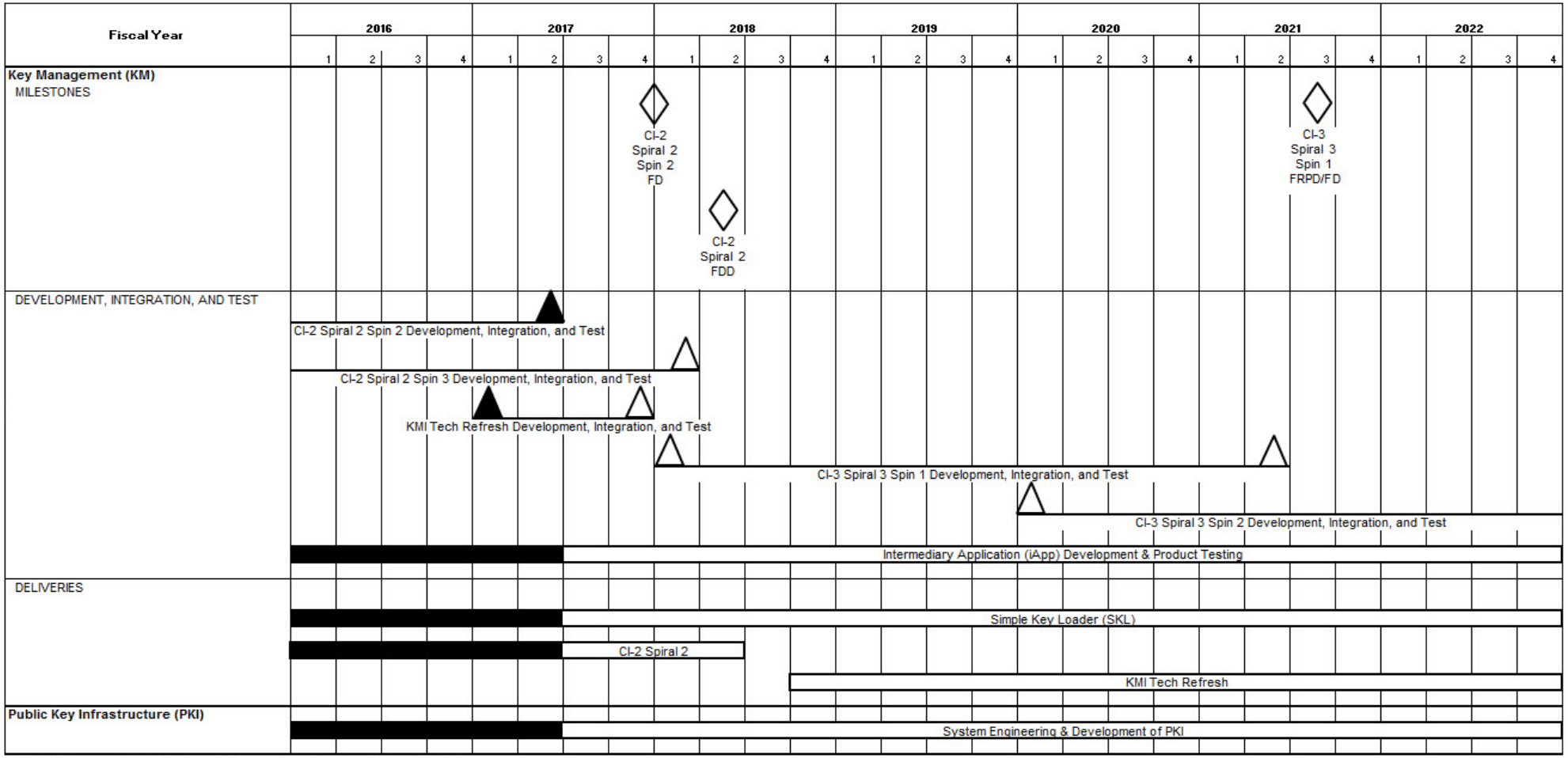

Note 1: Reference Section B Change Summary for schedule notes and explanations

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |



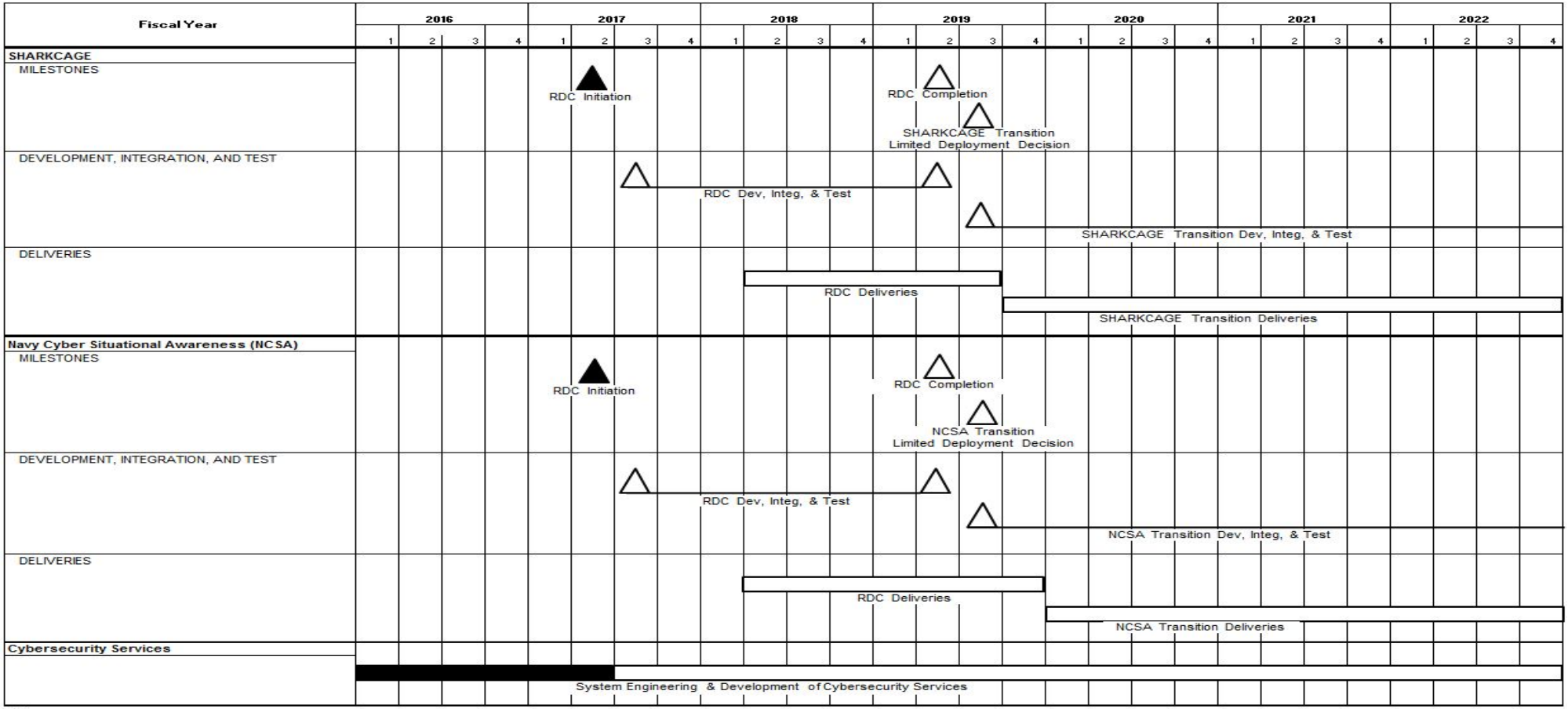

Note 1: Reference Section B Change Summary for schedule notes and explanations

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |




Note 1: Reference Section B Change Summary for schedule notes and explanations

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |




Notes:
1. SHARKCAGE and NCSA are planned Rapid Deployment Capability's (RDC). An RDC is the Navy's implementation of the Department of Defense (DoD) 5000 defined "Accelerated Acquisition Program." It provides the ability to react immediately to a newly discovered enemy threat(s) or potential enemy threat(s) through tailored procedures, to allow for fielding of mature capabilities based on Commercial Off-The-Shelf (COTS) and Non-Developmental Item (NDI) products within a 2 year period. At the end of that period, SHARKCAGE and NCSA are planning to transition to respective ACAT programs.
2. RDC Initiation milestone provides the authority to procure and field RDC units.
3. SHARKCAGE and NCSA were previously budgeted under Computer Network Defense (CND); broken out separately for greater visibility into cybersecurity.

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0734*** | | | | |
| CND - Build 4 Dev, Integ, & Test | 1 | 2016 | 2 | 2016 |
| CND - Build 5 Dev, Integ, & Test | 1 | 2016 | 4 | 2016 |
| CND - Build 6 Dev, Integ, & Test | 2 | 2016 | 4 | 2017 |
| CND - Build 7 Dev, Integ, & Test | 1 | 2017 | 3 | 2018 |
| CND - Build 8 Dev, Integ, & Test | 1 | 2018 | 3 | 2019 |
| CND - Build 9 Dev, Integ, & Test | 4 | 2018 | 2 | 2020 |
| CND - Build 10 Dev, Integ, & Test | 3 | 2019 | 1 | 2021 |
| CND - Build 11 Dev, Integ, & Test | 2 | 2020 | 4 | 2021 |
| CND - Build 12 Dev, Integ, & Test | 1 | 2021 | 3 | 2022 |
| CND - Build 13 Dev, Integ, & Test | 4 | 2021 | 4 | 2022 |
| CND - Inc 2 Deliveries | 1 | 2016 | 4 | 2022 |
| Crypto - VACM Full Rate Production (FRP) Decision | 3 | 2016 | 3 | 2016 |
| Crypto - VACM Initial Operational Capability (IOC) | 3 | 2016 | 3 | 2016 |
| Crypto - TRANSEC Studies & Analysis | 1 | 2016 | 2 | 2016 |
| Crypto - TRANSEC Development and Product Testing | 3 | 2016 | 2 | 2018 |
| Crypto - KGV-11M Development and Product Testing | 3 | 2018 | 2 | 2020 |
| Crypto - ACC Solutions Development and Product Testing | 1 | 2016 | 4 | 2022 |
| Crypto - Next Generation Crypto Development | 1 | 2020 | 4 | 2022 |
| Crypto - KGV-11M Development Contract Award | 2 | 2018 | 2 | 2018 |
| Crypto - KGV-11M PDR | 4 | 2018 | 4 | 2018 |
| Crypto - KGV-11M CDR | 3 | 2019 | 3 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Crypto - KGV-11M DT&E | 2 | 2020 | 2 | 2020 |
| Crypto - KGV-11M NSA Certification | 3 | 2020 | 3 | 2020 |
| Crypto - VACM Deliveries | 1 | 2018 | 4 | 2022 |
| Crypto - KGV-11M Deliveries | 4 | 2020 | 4 | 2022 |
| Crypto - ACC Deliveries | 4 | 2019 | 4 | 2022 |
| Key Management - KMI CI-2 Spiral 2 Spin 2 Development, Integration, and Test | 1 | 2016 | 2 | 2017 |
| Key Management - KMI CI-2 Spiral 2 Spin 3 Development, Integration, and Test | 1 | 2016 | 1 | 2018 |
| Key Management - KMI Tech Refresh Development, Integration, and Test | 1 | 2017 | 4 | 2017 |
| Key Management - KMI CI-3 Spiral 3 Spin 1 Development, Integration, and Test | 1 | 2018 | 2 | 2021 |
| Key Management - KMI CI-3 Spiral 3 Spin 2 Development, Integration, and Test | 1 | 2020 | 4 | 2022 |
| Key Management - Intermediary Application (iApp) Development and Product Testing | 1 | 2016 | 4 | 2022 |
| Key Management - KMI CI-2 Spiral 2 Spin 2 Fielding Decision (FD) | 4 | 2017 | 4 | 2017 |
| Key Management - KMI CI-2 Spiral 2 Full Deployment Decision (FDD) | 2 | 2018 | 2 | 2018 |
| Key Management - KMI CI-3 Spiral 3 Spin 1 FRP Decision / FD | 3 | 2021 | 3 | 2021 |
| Key Management - Simple Key Loader (SKL) Deliveries | 1 | 2016 | 4 | 2022 |
| Key Management - KMI CI-2 Spiral 2 Deliveries | 1 | 2016 | 2 | 2018 |
| Key Management - KMI Tech Refresh Deliveries | 4 | 2018 | 4 | 2022 |
| Public Key Infrastructure - System Engineering and Development of PKI | 1 | 2016 | 4 | 2022 |
| SHARKCAGE - RDC Initiation | 2 | 2017 | 2 | 2017 |
| SHARKCAGE - RDC Dev, Integ, & Test | 3 | 2017 | 2 | 2019 |
| SHARKCAGE - RDC Deliveries | 2 | 2018 | 3 | 2019 |
| SHARKCAGE - RDC Completion | 2 | 2019 | 2 | 2019 |
| SHARKCAGE - SHARKCAGE Transition Limited Deployment Decision | 3 | 2019 | 3 | 2019 |
| SHARKCAGE - SHARKCAGE Transition Dev, Integ, & Test | 3 | 2019 | 4 | 2022 |
| SHARKCAGE - SHARKCAGE Transition Deliveries | 4 | 2019 | 4 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>0734 / *Communications Security R&D* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| NCSA - RDC Initiation | 2 | 2017 | 2 | 2017 |
| NCSA - RDC Dev, Integ, & Test | 3 | 2017 | 2 | 2019 |
| NCSA - RDC Deliveries | 2 | 2018 | 4 | 2019 |
| NCSA - RDC Completion | 2 | 2019 | 2 | 2019 |
| NCSA - NCSA Transition Limited Deployment Decision | 3 | 2019 | 3 | 2019 |
| NCSA - NCSA Transition Dev, Integ, & Test | 3 | 2019 | 4 | 2022 |
| NCSA - NCSA Transition Deliveries | 1 | 2020 | 4 | 2022 |
| Cybersecurity - Systems Engineering & Development of Cybersecurity Services | 1 | 2016 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0303140N / *Information Sys Security Program* | Project (Number/Name)<br>3230 / *Information Assurance* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3230: *Information Assurance* | 14.376 | 2.120 | 1.523 | 2.415 | - | 2.415 | 2.390 | 2.230 | 2.274 | 2.318 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The goal of the Information Assurance (IA) program is to ensure the continued protection of Navy and joint information and information systems from hostile exploitation and attack. The Information Systems Security Program (ISSP) activities address the triad of Defense Information Operations: protection, detection, and reaction. Evolving attack sensing (detection), warning, and response (reaction) responsibilities extend far beyond the traditional ISSP role in protection of Information Systems Security (INFOSEC). Focused on the highly mobile forward deployed subscriber, the Navy's adoption of Network-Centric Warfare (NCW) places demands upon the ISSP, as the number of users expands significantly and the criticality of their use escalates. Today, the ISSP protects an expanding core of services critical to the effective performance of the Navy's mission.

The rapid rate of change in the underlying commercial and government information infrastructures makes the provision of security an increasingly complex and dynamic problem. IA technology mix and deployment strategies must evolve quickly to meet rapidly evolving threats and vulnerabilities. No longer can information security be divorced from the information infrastructure. The ISSP enables the Navy's war fighter to trust in the availability, integrity, authentication, privacy, and non-repudiation of information.

This project includes funds for advanced technology development, test and evaluation of naval information systems security based on leading edge technologies that will improve information assurance (e.g., situational awareness and information infrastructure protection) across all command echelons to tactical units afloat and war fighters ashore. This effort will provide the research to develop a secure seamless interoperable, common operational environment of networked information systems in the battle space and for monitoring and protecting the information infrastructure from malicious activities. This effort will provide naval forces a secure capability and basis in its achievement of protection from unauthorized access and misuse, and optimized IA resource allocations in the information battle space. This program will also develop core technology to: (1) improve network infrastructure resistance and resiliency to attacks; (2) enable the rapid development and certification of security-aware applications and information technologies in accordance with the common criteria for IA and IA-enabled information technology products by the National Security Telecommunications and Information Systems Security Committee; and (3) measure the effectiveness and efficiency of IA defensive capabilities under naval environments.

The program will develop common architectural frameworks that facilitate integration of network security capabilities, enable effective seamless interoperation, and contribute to a common consistent picture of the networked environment with respect to information assurance and security. This effort will address the need for a common operational picture for IA, as well as assessment of security technology critical to the success of the mission. This effort will also initiate requirements definition for situational awareness capabilities to support computer network defense in a highly-distributed, homogeneous, and heterogeneous networks including mobile and embedded networked devices. This effort also includes the architectural definition of situational awareness and visualization capabilities to support active computer network defense and support underlying data mining and correlation tools. This includes addressing the capability to remotely manage and securely control the configurations of network security components to implement changes in real time or near real time. This program will also initiate requirements definition for secure

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>3230 / *Information Assurance* |

coalition data exchange and interoperation among security levels and classifications, and ensure approaches address various security level technologies as well as emerging architectural methods of providing interoperability across different security levels. IA will examine multi-level aware applications and technologies including databases, web browsers, routers/switches, etc. Efforts will also initiate infrastructure protection efforts as the Navy develops network centric architectures and warfare concepts, ensuring an evolutionary development of security architectures and products for IA that addresses Navy infrastructure requirements. IA will ensure the architectures evolve to provide proper protection as technology, Department of Defense (DoD) missions, and threats continuously evolve. IA includes defensive protections as well as intrusion monitoring (sensors), warning mechanisms, and response capabilities in the architecture. Ensure the unique security and performance requirements of tactical systems, including those operating various security levels are addressed. Also, the program will initiate the efforts to conceptualize new network centric warfare technology to protect our assets, such as secure network gateways, routers, components and tools that improve the survivability of Navy networks. Additionally, IA will provide systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD requirements.

The increase in FY18 supports investment in efforts to improve effectiveness of cyber defenses and critical infrastructure protection and adequately fund continuing efforts from FY17.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Information Assurance (IA) | 2.120 | 1.523 | 2.415 | 0.000 | 2.415 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The increase in FY18 supports investment in efforts to improve effectiveness of cyber defenses and critical infrastructure protection and adequately fund continuing efforts from FY17. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continued the development of a security framework for mobile communication devices. The framework emphasized addressing the security issues associated with bring-your-own-device/bring-your-own-application (BYOD/BYOA), such as to support the integration of Droid and/or iPhone devices.<br><br>Continued the development of new sensing and instrumentation technology to measure the effectiveness of network security technology.<br><br>Continued the development of technology to provide prediction/early warning sensing of impending attacks based on network traffic and user behavior.<br><br>Continued the development of critical cryptographic technology to support Navy unique platforms and requirements such as Unmanned Aircraft Systems (UASs) (e.g., Unmanned Aerial Vehicles (UAVs), Unmanned Underwater Vehicles (UUV)) ensuring the technology addresses the limited size, weight and power issues, and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>3230 / *Information Assurance* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| multiple data classification processing requirements, while as providing on-the-fly programmability of mission data and key material to support various missions such as Communications Security (COMSEC), Electronic Intelligence (ELINT), Signals Intelligence (SIGINT), etc.<br><br>Continued systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and Department of Defense (DoD) requirements.<br><br>Completed the development of new network security technology focused on addressing nation state level sponsored activity. Enhance the security framework for federated infrastructures to support newly developed cross-domain services/devices.<br><br>Completed the development of a security framework for mobile communication devices. Addressed the security issues associated with bring-your-own-device/bring-your-own-application, such as to support the integration of phone and tablet devices.<br><br>Initiated the development of new host-based security technology focused on addressing data-at-rest requirements, protection of the operating system and applications from nation state-sponsored activities, and methods for system and software updates that do not invalidate the security framework of the host workstation. | | | | | |
| ***FY 2017 Plans:***<br>Continue the development of new host-based security technology focused on addressing data-at-rest requirements, protection of the operating system and applications from nation state-sponsored activities, and methods for system and software updates that do not invalidate the security framework of the host workstation.<br><br>Continue the development of technology to provide prediction/early warning sensing of impending attacks based on network traffic and user behavior. Provide initial response options/actions based on sensing predictions.<br><br>Continue the development of critical cryptographic technology to support Navy unique platforms and requirements such as UASs (e.g., UAVs, UUV) ensuring the technology addresses the limited size, weight and power issues, and multiple data classification processing requirements, while as providing on-the-fly programmability of mission data and key material to support various missions such as COMSEC, ELINT, SIGINT, etc. Adapt the solution for other candidate platforms in support of mission requirements. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>3230 / *Information Assurance* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD requirements.<br><br>Complete the development of new sensing and instrumentation technology to measure the effectiveness/provide metrics of network security technology against nation state adversaries.<br><br>Initiate the development of a new techniques/technology for discovering adversarial presence in Navy/DoD networks, especially for Advanced Persistent Threats (APT) within the network infrastructure and components/ workstations. Efforts will focus on detection, isolation and remediation. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD requirements.<br><br>Continue the development of a new techniques/technology for discovering adversarial presence in Navy/DoD networks, especially for advanced persistent threats (APT) within the network infrastructure and components/ workstations. Efforts will focus on detection, isolation and remediation while maintaining continuity of operations and access to critical data.<br><br>Complete the development of technology to provide prediction/early warning sensing of impending attacks based on network traffic and user behavior. Provide initial response options/actions based on sensing predictions and train sensors to address predicted threat to reduce the threat to engage cycle.<br><br>Complete the development of critical cryptographic technology to support Navy unique platforms and requirements such as UASs (e.g., UAVs, UUV) ensuring the technology addresses the limited size, weight and power issues, and multiple data classification processing requirements, while as providing on-the-fly programmability of mission data and key material to support various missions such as COMSEC, ELINT, SIGINT, etc. Adapt the solution for other candidate platforms based on successful technology demonstration. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0303140N / *Information Sys Security Program* | **Project (Number/Name)**<br>3230 / *Information Assurance* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Complete the development of new host-based security technology focused on addressing data-at-rest requirements, protection of the operating system and applications from nation state-sponsored activities, and methods for system and software updates that do not invalidate the security framework of the host workstation.<br><br>Initiate the development of new technology to support asset criticality and management to improve effectiveness of cyber defenses in support of mission execution, focusing on threats and attack propagation through the network.<br><br>Initiate the development of a new generation of cross-domain technology that focuses on critical infrastructure protection while protecting against sophisticated nation state attacks and exfiltration, while supporting new data models and formats for emerging Navy networks.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 2.120 | 1.523 | 2.415 | 0.000 | 2.415 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Protection of Navy and joint information from hostile exploitation and attack.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305160N *I Navy Meteorological and Ocean Sensors-Space(METOC)* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 2.640 | 0.599 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.239 |
| 0524: *Navy METOC Support (SPACE)* | 2.640 | 0.599 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.239 |

**A. Mission Description and Budget Item Justification**

This program element supports the Navy's requirements in meteorological and oceanographic (METOC) space-based remote sensors. These requirements include commitments to satellite, sensor, and operational demonstration/development activities as well as the transition to fleet applications associated with the joint Defense Meteorological Satellite Program (DMSP).

The Navy METOC Space-Based Sensing Capabilities project provides for Navy participation in Navy/Air Force cooperative efforts leading to DMSP sensor development, and specifically participation in the calibration and validation of instruments and delivery of satellite products to the fleet. The passive microwave instruments carried on the DMSP satellites provide global and atmospheric data of direct operational relevance, including sea surface wind, sea ice, and precipitation.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.599 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 0.599 | 0.000 | 0.000 | - | 0.000 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305160N / *Navy Meteorological and Ocean Sensors-Space(METOC)* | Project (Number/Name)<br>0524 / *Navy METOC Support (SPACE)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0524: *Navy METOC Support (SPACE)* | 2.640 | 0.599 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 3.239 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Meteorology and Oceanography (METOC) Space-Based Sensing Capabilities project provides for Navy participation in the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager and Special Sensor Microwave Imager Sounder calibration/validation efforts in support of the fleet operational requirements. The passive microwave instrument carried on DMSP provides global oceanic and atmospheric data of direct operational relevance, including sea surface wind speed, sea ice, and precipitation.

The METOC Space-Based Sensing Capabilities project ensures the naval service's operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP, the Joint Polar Satellite System (JPSS) and the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellites (GOES). These efforts fulfill naval service unique requirements that are not funded within the DMSP, JPSS or GOES programs, and are in accordance with current inter-agency agreements.

Beginning in FY 2017 funding was realigned to Program Element 0603207N, Project 2342.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** METOC Space-Based Sensing Capabilities | 0.599 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued performance assessment on National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) and Defense Meteorological Satellite Program (DMSP) satellite sensor suites. Continued assessment of planned environmental satellite sensor launches such as Geostationary Operational Environmental Satellite R-Series (GOES-R) and Global Change Observation Mission (GCOM) W-2 scheduled in FY16. | | | | | |
| ***FY 2017 Plans:***<br>Funding was realigned to PE 0603207N, project 2342. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305160N / *Navy Meteorological and Ocean Sensors-Space(METOC)* | **Project (Number/Name)**<br>0524 / *Navy METOC Support (SPACE)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.599 | 0.000 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD* | 16.173 | 20.165 | 19.997 | - | 19.997 | 20.869 | 21.221 | 21.698 | 22.162 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

Naval service unique, space based Meteorology and Oceanography (METOC) requirements. Particular sensors or data sources with unique naval service mission needs are targeted to accelerate acquisition or ensure threshold accomplishment of Joint or converged national program plans. The Joint Polar Satellite System (JPSS) program will collect global microwave radiometry and sounding data to produce microwave imagery and other meteorological and oceanographic data. Conical Microwave Imager Sounder (CMIS) can be viewed as the follow-on instrument to the Special Sensor Microwave (SSM) instruments Navy developed for the Defense Meteorological Satellite Program. These CMIS sensors will be acquired as part of the JPSS architecture which supports these Navy requirements in the future. Maintenance of rigorous sensor calibration and data validation for operational SSM instruments continues along with algorithm development in support of fleet applications. The Advanced Altimeter technologies will improve radar altimeter resolution and aerial coverage to support Navy requirements for sea surface topography measurement in the littorals.

**E. Performance Metrics**

Goal: Provide precise and near real-time METOC forecasting to the warfighter using existing and future space-based satellite derived data, including ocean surface wind speed, rain rate, ice concentration, and soil moisture measurements.
Metric: Provide precise ocean surface wind speed within plus or minus 2.0 meters per second, the rain over land and ocean rate within plus or minus 5.0 millimeters per hour, soil moisture measurements within plus or minus 10%; and sea ice concentrations within plus or minus 10%.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305192N *I JT Military Intel Programs* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 6.207 | 6.019 | 6.352 | - | 6.352 | 6.491 | 6.627 | 6.760 | 6.896 | Continuing | Continuing |
| 2246: *Intelligence Support to the Common Operational Picture* | 0.000 | 0.000 | 3.430 | 3.651 | - | 3.651 | 3.734 | 3.807 | 3.883 | 3.961 | Continuing | Continuing |
| 2295: *Maritime Support* | 0.000 | 6.207 | 2.589 | 2.701 | - | 2.701 | 2.757 | 2.820 | 2.877 | 2.935 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 6.207 | 6.019 | 6.352 | - | 6.352 |
| Current President's Budget | 6.207 | 6.019 | 6.352 | - | 6.352 |
| Total Adjustments | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |

**Change Summary Explanation**

Technical: Not applicable.

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305192N / *JT Military Intel Programs* | Project (Number/Name)<br>2246 / *Intelligence Support to the Common Operational Picture* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2246: *Intelligence Support to the Common Operational Picture* | 0.000 | 0.000 | 3.430 | 3.651 | - | 3.651 | 3.734 | 3.807 | 3.883 | 3.961 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0305192N / *JT Military Intel Programs* | | | | Project (Number/Name)<br>2295 / *Maritime Support* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2295: *Maritime Support* | 0.000 | 6.207 | 2.589 | 2.701 | - | 2.701 | 2.757 | 2.820 | 2.877 | 2.935 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305204N *I Tactical Unmanned Aer Vehicles* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 244.866 | 8.550 | 8.436 | 7.770 | - | 7.770 | 10.070 | 9.209 | 9.394 | 9.582 | Continuing | Continuing |
| 2478: *Tactical Control System* | 244.866 | 8.550 | 8.436 | 7.770 | - | 7.770 | 10.070 | 9.209 | 9.394 | 9.582 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This program element provides for development and capability requirements for Tactical Unmanned Aerial Vehicles. Project is a Joint Military Intelligence Program.

The Tactical Control System (TCS), a component of the MQ-8 System, provides for the joint tactical MQ-8 Fire Scout System. TCS, integrated into the MQ-8 Mission Control System, provides the warfighters with the capability for day/night aerial Intelligence, Surveillance and Reconnaissance, Target Acquisition, voice, data and command and control communications/relay, and mine detection and localization. Additionally, TCS provides a multi-level, scalable, and flexible operator control of the air vehicles and payloads, as well as direct receipt and dissemination of unmanned aerial vehicle sensor data.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 8.550 | 8.436 | 8.897 | - | 8.897 |
| Current President's Budget | 8.550 | 8.436 | 7.770 | - | 7.770 |
| Total Adjustments | 0.000 | 0.000 | -1.127 | - | -1.127 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.000 | 0.000 | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -1.035 | - | -1.035 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.092 | - | -0.092 |

**Change Summary Explanation**

The FY 2018 funding request was reduced by $1.050M to account for the availability of prior year execution balances.

Cost: FY18-FY20 resources were adjusted to align with TCS to Common Control System (CCS) transition.

Schedule: Updated TCS schedule and software improvements to coincide with MQ-8 Fire Scout schedule milestones.

MQ-8 related milestones revised: Updated Milestone C decision, test requirements, and IOC for the restructured MQ-8 Fire Scout program.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305204N *I Tactical Unmanned Aer Vehicles* |

Technical: None

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305204N / *Tactical Unmanned Aer Vehicles* | Project (Number/Name)<br>2478 / *Tactical Control System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2478: *Tactical Control System* | 244.866 | 8.550 | 8.436 | 7.770 | - | 7.770 | 10.070 | 9.209 | 9.394 | 9.582 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The TCS program supports the MQ-8 Fire Scout System and is a standards-based system, which provides interoperability and commonality for Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interfaces of Unmanned Aircraft Systems (UAS). TCS software, operating on Mission Control System (also referred to as a Ground Control Station) hardware, utilizes North Atlantic Treaty Organization (NATO) Standardization Agreements (STANAG)-4586 architecture to communicate across a Tactical Common Data Link.

TCS provides a full range of scalable UAS capabilities from passive receipt of air vehicle and payload data to full air vehicle and payload command and control. TCS offers the warfighter a common core operating environment to simultaneously receive, process, and disseminate data from different UAS types for intelligence, reconnaissance, surveillance, and combat assessment.

This program supports enhancements and updates to TCS in order to continue to meet supported air vehicle enhancements, incorporation of new technologies that will be used to enhance overall system performance, incorporate new payloads and payload capabilities (such as advanced sensors and weapons), incorporate multi-vehicle control, incorporate NATO STANAG-4586 and Command, Control, Communications, Computers and Intelligence enhancements, and alignment with OSD direction for UAS control segments.

TCS software is incorporated into the MQ-8 Fire Scout System and fields in conjunction with MQ-8. TCS software addresses MQ-8 requirements validated by the Joint Requirements Oversight Council in the MQ-8 Capability Production Document (Nov 2016) and multiple Joint Emergent Operational Need/Urgent Operational Needs statements. TCS is supported by an Operational Requirements Document (Feb 2000).

TCS maximizes the use of contractor and government off-the-shelf hardware and software whenever possible and incorporates software/hardware enhancements where appropriate to maintain growth potential and minimize hardware and operating system dependence. TCS software is interoperable and is compliant with the OSD Command and Control, Communications, Intelligence Joint Technical Architecture, Distributed Common Ground System standards, Global Command and Control System, and NATO standards. TCS hardware and software upgrades support the Navy's Common Control System migration.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** TCS Development and Integration | 7.882 | 7.752 | 7.038 | 0.000 | 7.038 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204N / *Tactical Unmanned Aer Vehicles* | **Project (Number/Name)**<br>2478 / *Tactical Control System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continued TCS integration and test with MQ-8 development. Continued new TCS capabilities to support requirements for Littoral Combat Ship (LCS) efforts. Continued TCS STANAG 4586 compliance. Continued TCS C4ISR interface integration and testing for MQ-8 systems. Continued hardware and operating system independence initiatives. Continued Radar and payload integration, MQ-8C integration, and continue preparations for Common Control System integration and demonstrations. Completed TCS Version 5 Linux transition, continued TCS Version 6 technology refresh, and continued TCS Version 7 service oriented architecture.<br>***FY 2017 Plans:***<br>Continue TCS integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for LCS efforts. Continue TCS STANAG 4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue Radar and payload integration, MQ-8C integration, and continue preparations for Common Control System integration and demonstrations. Commence TCS Version 7 Common GCS transition preparation and TCS Version 8 Common GCS transition initiation.<br>***FY 2018 Base Plans:***<br>Continue TCS integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for LCS efforts. Continue TCS STANAG 4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue Radar and payload integration and test, MQ-8C integration, and continue preparations for Common Control System (CCS) integration and demonstrations. Continue TCS Version 8 Common GCS transition and initiate TCS Version 9 CCS preparations.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Technical and Engineering Services | 0.668 | 0.684 | 0.732 | 0.000 | 0.732 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued government engineering support, contractor support, program support, and travel for the TCS program.<br>***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305204N / *Tactical Unmanned Aer Vehicles* | **Project (Number/Name)**<br>2478 / *Tactical Control System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue government engineering support, contractor support, program support, and travel for the TCS program.<br>***FY 2018 Base Plans:***<br>Continue government engineering support, contractor support, program support, and travel for the TCS program.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 8.550 | 8.436 | 7.770 | 0.000 | 7.770 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The Tactical Control System (TCS) program is government owned, non-proprietary software that currently supports the MQ-8 Fire Scout System. The TCS program continues to focus on Navy requirements and standards-based architecture/software to support interoperability. The government-owned TCS software development toolkit is available to all UAS developers and manufacturers that allows a low-cost integration into the open architecture non-proprietary TCS system. TCS provides software modules to the Navy Common Control System (CCS) and the TCS tech refresh hardware supports migration to CCS software.

**E. Performance Metrics**

Successfully complete Navy payloads integration, to include Coastal Battlefield Reconnaissance and Analysis (COBRA). Support MQ-8C Endurance Upgrade, Radar, and future capabilities. Successfully complete Littoral Combat Ship Integration. Complete Developmental and Operational Test.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305205N *I (U)UAS Integration and Interoperability* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 42.202 | 36.509 | 39.736 | - | 39.736 | 17.547 | 11.184 | 11.426 | 11.645 | Continuing | Continuing |
| 3379: *Common Control System* | 0.000 | 42.202 | 36.509 | 39.736 | - | 39.736 | 17.547 | 11.184 | 11.426 | 11.645 | Continuing | Continuing |

**Note**

The Common Control System (CCS) was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. In FY16, the UCLASS program transitioned to MQ-25 Stingray. CCS Increment I development began 3Q2013.

**A. Mission Description and Budget Item Justification**

This PE funds the Unmanned Systems (UxSs) Common Control System (CCS). The primary mission of CCS is to provide common control across the Navy's UxS portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control, and enable rapid integration of UxS capabilities across all domains: Aviation, Surface, Sub-Surface, and Ground.

This program will define, develop, and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval UxSs. CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS contractors as required. The CCS acquisition approach is to provide increasing UxS capability through incremental development for UxS platforms as follows:

Increment I will provide initial Unmanned Air System (UAS) vehicle control functionality for MQ-25 Stingray launch & recovery, maneuvering & stationing, situational awareness, and health & performance status with a common CCS Vehicle Management (VM) capability integrated with legacy platform Mission Management/Mission Planning (MM/MP) capabilities hosted on legacy platform hardware. Other UAS platforms for follow-on CCS transition include MQ-4 Triton and MQ-8 Fire Scout. Efforts will include exploring opportunities for other UxS platforms from across all domains to benefit from CCS development.

Increment II will maintain and update, as necessary, the core Increment I VM baseline and add common MM/MP capabilities hosted on legacy platform hardware. Additionally, Increment II adds robust cybersecurity controls, key systems safety attributes, and core program infrastructure to include a system integration lab and software support activities (SSA).

Increment III aligns Common Control software and hardware for the Naval UxS control segment.

CCS will be a ship/shore/airborne/expeditionary based common control segment that provides VM and MM/MP capabilities for Naval Group 2 through 5 Unmanned Aerial Vehicles (UAVs) and other domain UxS's. The CCS will provide open software architecture, based on the OSD Unmanned Control Segment (UCS) architecture, that is scalable to evolving Service requirements and is supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305205N *I (U)UAS Integration and Interoperability* |

The CCS PU funds two Speed-to-the-Fleet capability initiatives: 1) Full Motion Video (FMV) for Geo-intelligence Unified Naval Streaming System (GUNSS) and 2) Moving Target Indicator (MTI) for Broad Area Maritime Surveillance - Demonstrator (BAMS-D).

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 41.831 | 36.509 | 20.473 | - | 20.473 |
| Current President's Budget | 42.202 | 36.509 | 39.736 | - | 39.736 |
| Total Adjustments | 0.371 | 0.000 | 19.263 | - | 19.263 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 1.200 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.829 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 19.100 | - | 19.100 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.163 | - | 0.163 |

**Change Summary Explanation**

Program Adjustment of $19.1M in FY18 to align CCS capability delivery with the MQ-25 schedule.

MQ-25 Stingray, MQ-4 Triton and MQ-8 Fire Scout nomenclature standardized throughout entire budget exhibit.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305205N / *(U)UAS Integration and Interoperability* | Project (Number/Name)<br>3379 / *Common Control System* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3379: *Common Control System* | 0.000 | 42.202 | 36.509 | 39.736 | - | 39.736 | 17.547 | 11.184 | 11.426 | 11.645 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

The Common Control System was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. The Common Control System (CCS) was budgeted in PE 0604404N: Unman Carrier Launch A/B Surv & Strike (UCLASS) Sys prior to FY16. In FY16, the UCLASS program transitioned to MQ-25 Stingray.

**A. Mission Description and Budget Item Justification**

This PE funds the Unmanned System (UxS) Common Control System (CCS). The primary mission of CCS is to provide common control across the Navy's UxS portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control, and enable rapid integration of UxS capabilities across all domains: Aviation, Surface, Sub-Surface, and Ground.

This program will define, develop and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval (UxSs). CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS Contractors as required. In alignment with the Office of the Chief of Naval Operations Directorate for Air Warfare Systems (OPNAV N98), the CCS acquisition approach is to provide increasing UxS capability through incremental development for UxS platforms as follows:

Increment I will provide initial Unmanned Aerial System (UAS) vehicle control functionality for MQ-25 Stingray launch & recovery, maneuvering & stationing, situational awareness, and health & performance status with a common Vehicle Management (VM) capability using legacy platform Mission Management/Mission Planning (MM/MP) capabilities hosted on legacy platform hardware. Other UAS platforms for follow-on CCS transition include MQ-4 Triton and MQ-8 Fire Scout. Efforts will include exploring opportunities for other UxS platforms from across all domains to benefit from CCS invested developments.

Increment II will maintain and update, as necessary, the core VM baseline and add common MM/MP capabilities hosted on legacy platform hardware. Additionally, Increment II adds robust cybersecurity measures, key systems safety attributes, and core program infrastructure to include system integration lab and software support activities.

Increment III aligns Common Control software and hardware for the Naval UxS control segment.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |

CCS will be a ship/shore/airborne/expeditionary based common control segment that provides VM and MM/MP capabilities for Naval Group 2 through 5 Unmanned Aerial Vehicles (UAVs) and other domain UxS's. The CCS will provide open software architecture, based on the OSD Unmanned Control Segment (UCS) architecture, that is scalable to evolving Service requirements and is supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

The CCS PU funds two Speed-to-the-Fleet capability initiatives: 1) Full Motion Video (FMV) for Geo-intelligence Unified Naval Streaming System (GUNSS) and 2) Moving Target Indicator (MTI) for Broad Area Maritime Surveillance - Demonstrator (BAMS-D).

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Increment I | 34.331 | 17.400 | 16.946 | 0.000 | 16.946 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Common Control System (CCS) Increment I provides MQ-25 Stingray Unmanned Air System (UAS) Vehicle Management (VM) with legacy platform Mission Management/Planning (MM/MP) capability hosted on legacy platform hardware. Other UAS platforms for follow-on CCS transition include MQ-4 Triton and MQ-8 Fire Scout. | | | | | |
| ***FY 2016 Accomplishments:***<br>FY16 accomplishments include the continuation of CCS Increment 1 Vehicle Management software development, integration, and test. Additional accomplishments include CCS Increment 1 Build 2 software delivery software delivery for installation into the MQ-25A lab and a Large Displacement Unmanned Undersea Vehicle (LDUUV) limited extensibility demonstration. Efforts ensured that maximum commonality and applicability was maintained for continued transition of other UxSs. | | | | | |
| ***FY 2017 Plans:***<br>Development of CCS VM capability will continue in FY17 and will include initial CCS VM build delivery to MQ-25A to support the MQ-25A development and will also include initial CCS VM engineering build releases to support risk reduction for Triton and Fire Scout VM transition. FY17 plans include requirements and architecture identification, definition, and analysis of surface, sub-surface, and ground UxS. | | | | | |
| ***FY 2018 Base Plans:***<br>Development of CCS VM capability will continue in FY18 and includes support for accelerated MQ-25 Stingray capability delivery, CCS VM build delivery to MQ-8 Fire Scout, and includes initial CCS VM engineering | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| activities to support risk reduction for MQ-4 Triton. Increment I Vehicle Management capabilities and common requirements definition, analysis, and development may be initiated in FY18 for other UxS target platforms.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Increment II | 7.871 | 19.109 | 22.790 | 0.000 | 22.790 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** CCS Increment II will maintain and update as necessary the core Vehicle Management (VM) baseline and will add common Mission Management/Mission Planning (MM/MP) capability hosted on legacy platform hardware. CCS Increment II will be the future MM/MP baseline for MQ-25 Stingray. Plans include ensuring that maximum commonality is maintained for transition to MQ-4 Triton, MQ-8 Fire Scout, and other UxS. Increment II incorporates cybersecurity measures, key systems safety attributes, and core program infrastructure to include system integration lab and software support activities.<br>***FY 2016 Accomplishments:***<br>FY16 accomplishments included requirements identification, definition, analysis, UxS trade studies, and initiation of accelerated development of migration plans for Triton and Fire Scout UAS platforms.<br>***FY 2017 Plans:***<br>In FY17 CCS Increment II will, concurrently with Increment I development, refine requirements and architecture and accelerate software development for the MM/MP core components. FY17 activities include initial CCS Increment II software build development to support MQ-25A, the development of the GUNSS and the MTI Speed-to-the-Fleet capabilities initiatives, and continuation of trade studies and requirements development for Triton and Fire Scout.<br>***FY 2018 Base Plans:***<br>In FY18, CCS Increment II will begin initial software development incorporating results of requirements and architecture development efforts. Increment II plans to develop and integrate cybersecurity software modules into the CCS software baseline. Increment II (Mission Planning and Mission Management) common requirements definition, analysis, and development will be initiated in FY18. Target platforms include: MQ-25 Stingray, MQ-8 Fire Scout and MQ-4 Triton but may be expanded to other UxS domains. Additionally, Increment II planning will include establishment of the Software Support Activity (SSA) for CCS.<br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 42.202 | 36.509 | 39.736 | 0.000 | 39.736 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTEN/0604404N: *Unman Carrier Launch A/B Surv & Strk (UCLASS) Sys* | 414.376 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 839.182 |
| • RDTEN/0605414N: *Unmanned Carrier Aviation (UCA)* | 0.000 | 89.000 | 222.126 | - | 222.126 | 484.950 | 612.793 | 515.313 | 554.604 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

PEO(U&W) issued an Acquisition Decision Memorandum (ADM) 5000 Ser PEO(U&W)/11-093 dated July 1, 2011 to establish the Common Control System (CCS) to achieve Unmanned Aircraft System (UAS) common control across Program Executive Office Unmanned Aviation and Weapon Systems (PEO(U&W)) UAS platforms to eliminate redundant efforts, encourage innovation, and improve cost control of unmanned aviation. In coordination with the ADM, the program will define, develop and deliver a common control system to operate respective Naval Unmanned Systems (UxSs). This will include a common framework, a common user interface, and common components that will be integrated and tested with unique components on emerging or legacy platforms. The CCS acquisition approach is to provide increasing common UxS capability through incremental development for UxS platform as follows: Increment I will provide UxS Vehicle Management capability to support MQ-25 Stingray, MQ-4 Triton, and MQ-8 Fire Scout; Increment II will maintain and update as necessary the core UAS VM baseline and adds common UxS Mission Management/Mission Planning capability; Increment III aligns Common Control software and hardware for the Naval UxS control segment. CCS will be provided to the MQ-25 Stingray air vehicle prime as Government-Furnished Equipment (GFE) and also for transition into MQ-4 Triton and MQ-8 Fire Scout. CCS will leverage existing government-owned products as well as employ competitive procurement vehicles to support MQ-25 Stingray and will transition MQ-4 Triton, MQ-8 Fire Scout, and other Naval UxS across multiple domains.

**E. Performance Metrics**

CCS uses a Service-Oriented Architecture based on the OSD Unmanned Control Segment (UCS) architecture. The CCS Capability Development Document (CDD) and CONOPS will be developed in FY16-17 and will inform the Common Control requirements and Key Performance Parameters (KPPs). CCS will inherit common requirements of each supported UxS platform's CDD/CPD through the respective specification trees. CCS must therefore also support the KPPs, Measures of Suitability/ Effectiveness, Concepts of Operations, etc., flowed down from each supported platform.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Software Development | C/CPFF | Raytheon : Dulles, VA | 0.000 | 17.036 | Apr 2016 | 11.141 | Dec 2016 | 8.000 | Dec 2017 | - | | 8.000 | 0.000 | 36.177 | 36.177 |
| Advanced Development | WR | NAWC-WD : China Lake, CA | 0.000 | 2.875 | Nov 2015 | 2.700 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | Continuing | Continuing | Continuing |
| Software Cyber Modeling | C/CPFF | JHU APL : Baltimore, MD | 0.000 | 2.000 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.000 | 2.000 |
| Architecture Development | C/CPFF | SEI : Hanscom, MA | 0.000 | 1.205 | Apr 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.205 | 1.205 |
| Architecture Development | C/CPFF | NRL : Washington, DC | 0.000 | 2.330 | Jan 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.330 | 2.330 |
| Architecture Development | Various | Various : Various | 0.000 | 2.461 | Apr 2016 | 5.660 | Apr 2017 | 1.713 | Feb 2018 | - | | 1.713 | 0.000 | 9.834 | 9.834 |
| SSA - Software Integration | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 10.400 | Feb 2018 | - | | 10.400 | 0.000 | 10.400 | 10.400 |
| | | **Subtotal** | 0.000 | 27.907 | | 19.501 | | 21.113 | | - | | 21.113 | - | - | - |

**Remarks**

The FY18 SSA software integration contract supports the establishment of a CCS software support activity (SSA). This contract will be a competitive award in FY18 so the performing activity and location are currently TBD due to the competitive contracting strategy.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering | WR | NAWC-AD : Pax River, MD | 0.000 | 4.900 | Nov 2015 | 8.395 | Nov 2016 | 4.258 | Nov 2017 | - | | 4.258 | Continuing | Continuing | Continuing |
| Lead Systems Engineering and Integration | WR | NAWC-WD : Pt Mugu, CA | 0.000 | 2.545 | Nov 2015 | 3.903 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 6.448 | 6.448 |
| Systems Engineering | C/CPFF | Engility : Pax River, MD | 0.000 | 0.756 | Dec 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.756 | 0.756 |
| Systems Engineering Integration Test | C/CPFF | Booz Allen : Pax River, MD | 0.000 | 2.714 | Jun 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.714 | 2.714 |
| Systems Engineering Study | C/CPFF | CNA : Alexandria, VA | 0.000 | 0.800 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.800 | 0.800 |
| Systems Engineering | Various | Various : Various | 0.000 | 1.100 | Feb 2016 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.100 | 1.100 |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305205N / *(U)UAS Integration and Interoperability* | Project (Number/Name)<br>3379 / *Common Control System* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Integration | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 8.700 | Feb 2018 | - | | 8.700 | 0.000 | 8.700 | 8.700 |
| Systems Engineering Technical Agent | C/CPFF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 4.000 | Feb 2018 | - | | 4.000 | 0.000 | 4.000 | 4.000 |
| | | **Subtotal** | 0.000 | 12.815 | | 12.298 | | 16.958 | | - | | 16.958 | - | - | - |

**Remarks**

The FY18 Systems Integration and Systems Engineering Technical Agent contracts will be a competitive award in FY18 so the performing activity and location are currently TBD due to the competitive contracting strategy.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT&E/OT | WR | NAWC-AD : Pax River, MD | 0.000 | 0.100 | Nov 2015 | 1.573 | Nov 2016 | 0.800 | Nov 2017 | - | | 0.800 | Continuing | Continuing | Continuing |
| DT&E | WR | NAWC-WD : Pt Mugu, CA | 0.000 | 0.730 | Nov 2015 | 1.700 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 2.430 | 2.430 |
| | | **Subtotal** | 0.000 | 0.830 | | 3.273 | | 0.800 | | - | | 0.800 | - | - | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | WR | NAWC-AD : Pax River, MD | 0.000 | 0.650 | Nov 2015 | 1.437 | Nov 2016 | 0.865 | Nov 2017 | - | | 0.865 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.650 | | 1.437 | | 0.865 | | - | | 0.865 | - | - | - |

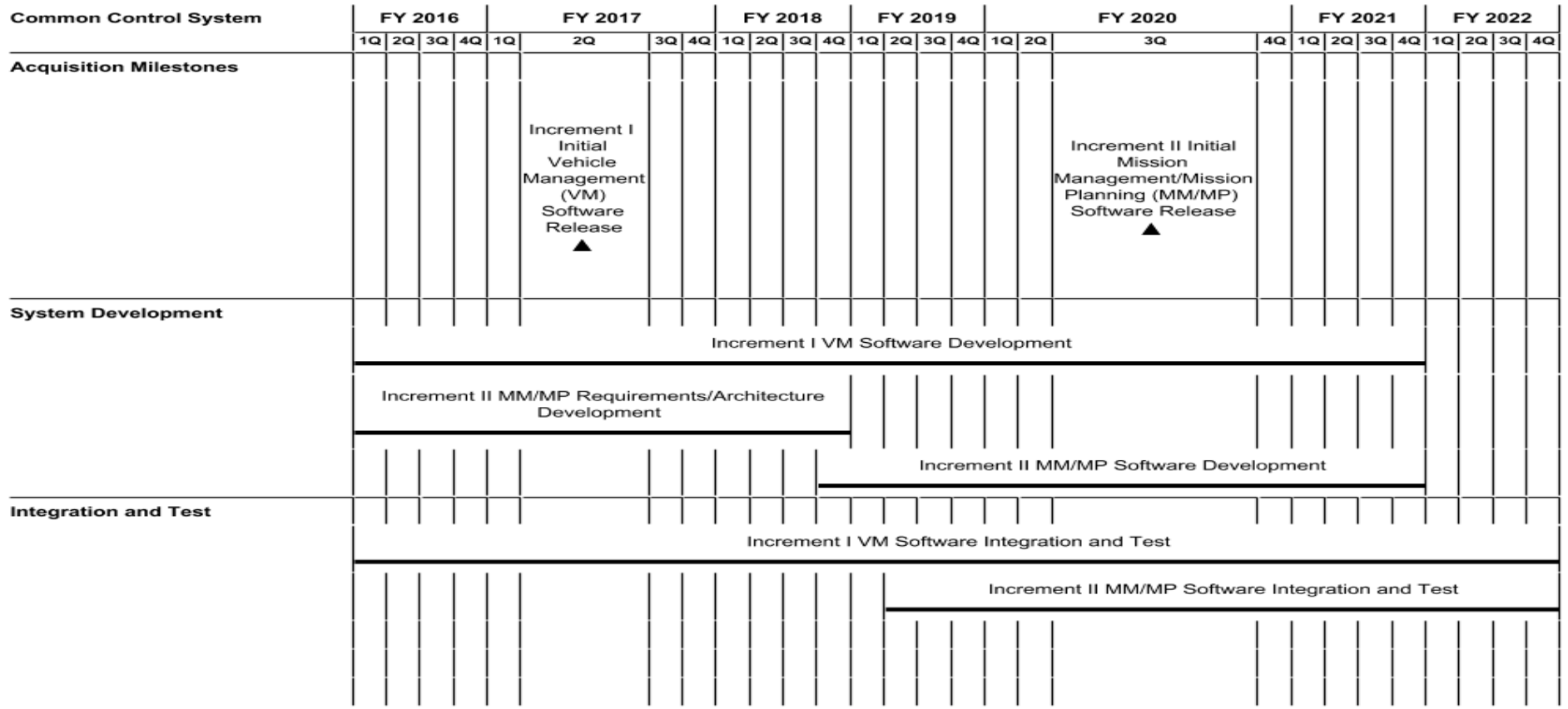
| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 42.202 | | 36.509 | | 39.736 | | - | | 39.736 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305205N / *(U)UAS Integration and Interoperability* | Project (Number/Name)<br>3379 / *Common Control System* | |

| | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |




*2018OSD - 0305205N - 3379*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305205N / *(U)UAS Integration and Interoperability* | **Project (Number/Name)**<br>3379 / *Common Control System* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Common Control System*** | | | | |
| Acquisition Milestones: Increment I Initial Vehicle Management (VM) Software Release | 2 | 2017 | 2 | 2017 |
| Acquisition Milestones: Increment II Initial Mission Management/Mission Planning (MM/MP) Software Release | 3 | 2020 | 3 | 2020 |
| System Development: Increment I VM Software Development | 1 | 2016 | 4 | 2021 |
| System Development: Increment II MM/MP Requirements/Architecture Development | 1 | 2016 | 4 | 2018 |
| System Development: Increment II MM/MP Software Development | 4 | 2018 | 4 | 2021 |
| Integration and Test: Increment I VM Software Integration and Test | 1 | 2016 | 4 | 2022 |
| Integration and Test: Increment II MM/MP Software Integration and Test | 2 | 2019 | 4 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305208M *I (U)Distributed Common Ground/Surface Systems* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 70.765 | 1.105 | 2.100 | 12.867 | - | 12.867 | 3.947 | 3.766 | 3.287 | 3.291 | Continuing | Continuing |
| 2268: *Distributed Common Ground System (DCGS-MC)* | 70.765 | 1.105 | 2.100 | 12.867 | - | 12.867 | 3.947 | 3.766 | 3.287 | 3.291 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

DCGS-MC, in compliance with the Department of Defense DCGS Family of Systems (FOS) concept, is a service-level effort to migrate select USMC Intelligence, Surveillance and Reconnaissance (ISR) processing and exploitation capabilities into a single, integrated, net-centric baseline that will be interoperable with other services and agencies.

Multiple functional capability sets will be configured to support Marine intelligence analysts across the Marine Air-Ground Task Force (MAGTF). The goal of DCGS-MC is to make external and internal ISR data more visible, accessible, and understandable.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 1.105 | 2.100 | 2.928 | - | 2.928 |
| Current President's Budget | 1.105 | 2.100 | 12.867 | - | 12.867 |
| Total Adjustments | 0.000 | 0.000 | 9.939 | - | 9.939 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 9.930 | - | 9.930 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.009 | - | 0.009 |

**Change Summary Explanation**

The increase of $10.767M from FY17 to FY18 provides integration and interoperability testing of a Joint Worldwide Intelligence Communications System (JWICS) Cross Doman Solution, software and hardware consolidation studies to support the development of a Common Geospatial Intelligence (GEOINT) Server, software capability enhancements for the Enterprise DCGS Integration Backbone (DIB) Services (EDS), and Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal integration, as well as integration and test efforts to provide the National Geospatial Intelligence Agency's (NGA) iStore Integrated Product Library and data ingest capability within the DCGS-MC Programs of Record. Increase also supports imagery hardware AAO increase, including approximately 35 Tactical

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305208M *I (U)Distributed Common Ground/Surface Systems* |

Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets which are designated for Joint Strike Fighter. Additionally, funds support integration and test efforts associated with geospatial and imagery hardware refreshes of current fielded assets. These efforts enhance the USMC's Intelligence sharing and fusion efforts, provide greater awareness in the Joint/Coalition Environment, and contribute directly to the Joint Processing Exploitation Dissemination (JPED) effort.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>2268 / *Distributed Common Ground System (DCGS-MC)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2268: *Distributed Common Ground System (DCGS-MC)* | 70.765 | 1.105 | 2.100 | 12.867 | - | 12.867 | 3.947 | 3.766 | 3.287 | 3.291 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

Distributed Common Ground/Surface System Marine Corps (DCGS-MC) Enterprise will be a Family of Systems (FoS) providing all source analysis and production within garrison and deployed Marine Corps organizations. DCGS-MC will comply with the Department of Defense (DOD) DCGS Enterprise interoperability and information sharing requirements by migrating select processing, exploitation, analysis, and production capabilities into a single, integrated, net-centric baseline within the Marine Corps Intelligence, Surveillance and Reconnaissance Enterprise (MCISRE). This baseline will enable MCISRE analysts to deliver tactically focused, operational and strategic intelligence at the tactical edge throughout all phases of operations and will provide relevant, precise decision support for Joint Task Force (JTF), Marine Air Ground Task Force (MAGTF), and subordinate Marine units. The DoD DCGS Enterprise provides worldwide garrison, and forward projection of tactical ISR capabilities at the JTF level and below. The DoD DCGS Enterprise enhances intelligence sharing within the Joint Services, the Intelligence Community, and Coalition Forces throughout all phases of operations. Each individual Military Service DCGS Program of Record provides unique and distinct capabilities to the overall DoD DCGS Enterprise. DCGS-MC GEOINT consists of GEOINT Imagery and Topographic Capability, Enterprise DCGS Integration Backbone System (EDS), Virtual Imagery Processing - Marine Corps (VIP-MC), Target Material Production (TMP) Full Motion Video Optical Navigation Exploitation (FMV-ONE), and Moving Target Indicator (MTI) systems. These capabilities will provide the USMC GEOINT analysts with the capability to process, disseminate, exploit, analyze and produce intelligence. Future capabilities will be delivered via clearly defined Engineering Change Proposals (ECPs). The specific content of each ECP will be determined by an integrated assessment of user needs, technology readiness, risk mitigation, and affordability.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Test and Evaluation | 1.051 | 1.948 | 8.683 | 0.000 | 8.683 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The overall increase of $6.735M from FY17 to FY18 provides integration and interoperability testing of a Joint Worldwide Intelligence Communications System (JWICS) Cross Doman Solution (CDS) that will facilitate the ability to share higher level intelligence to a broader audience for analysis and action. Funding also addresses Joint Strike Fighter (JSF) requirements, including initiation and test efforts for approximately 35 Tactical Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms. Funding will be used to support the integration of Commercial Joint Mapping Toolkit (CJMTK) Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal to price data sharing and data management capability across Marine Expeditionary Forces/Intelligence (INTEL) Battalions and MCISRE Network architectures. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Additionally, funds will support integration and test efforts associated with geospatial intelligence (GEOINT) and imagery hardware refreshes of current fielded assets and testing and cyber security certification of National Geospatial Intelligence Agency's (NGA) iSTORE Software into the DCGC-MC Programs of Record (PoR). Specifically for EDS, intent is to provide an Enhanced Directory Monitor, Optical Character Recognition, Acronym Finder, Geospatial Extraction, and Metadata Entry Automation capability software enhancements. DCGS-MC will be multi-network capable, able to integrate with Intelligence databases and elements of the DoD DCGS Enterprise on JWICS and Coalition networks.<br><br>***FY 2016 Accomplishments:***<br>- Continued Post Milestone C System Engineering Test Review (SETR) activities associated with DCGS-MC Capability Drops, software integration and associated test events.<br>- Continued test efforts in support of commonality of HW/SW baselines across GEOINT systems, such as DCGS-MC, VIP-MC, TEG-RWS and TPC.<br>- Completed EDS Graphic User Interface update.<br>- Initiated Cyber Security Test Events to maintain system security postures.<br>- Initiated Operating System upgrade integration into DCGS-MC GEOINT Systems.<br>- Initiated test efforts in support of Geodetic Survey Set refresh.<br>***FY 2017 Plans:***<br>- Continue Post Milestone C System Engineering Test Review (SETR) activities associated with DCGS-MC Capability Drops, software integration and associated test events.<br>- Continue test efforts in support of commonality of HW/SW baselines across GEOINT systems, such as DCGS-MC, VIP-MC, TEG-RWS and TPC.<br>- Continue Cyber Security Test Events to maintain system security postures.<br>- Continue Operating System upgrade integration into DCGS-MC GEOINT Systems.<br>- Complete test efforts in support of Geodetic Survey Set refresh.<br>***FY 2018 Base Plans:***<br>- Continue Post Milestone C System Engineering Test Review (SETR) activities associated with DCGS-MC Capability Drops, software integration and associated test events.<br>- Continue test efforts in support of commonality of HW/SW baselines across GEOINT systems, such as DCGS-MC, VIP-MC, TEG-RWS and TPC.<br>- Continue Operating System upgrade integration into DCGS-MC GEOINT Systems.<br>- Continue Cyber Security Test Events to maintain system security postures. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Initiate integration and interoperability testing of a Joint Worldwide Intelligence Communications System (JWICS) Cross Doman Solution (CDS) that will be part of the DCGS portfolio Approved Acquisition Objective and facilitate the ability to share higher level intelligence to a broader audience for analysis and action.<br>-Initiate Joint Strike Fighter (JSF) requirements, including initiation and test efforts for approximately 35 Tactical Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms.<br>- Initiate test events associated with GEOINT hardware refresh.<br>- Initiate test events associated with Imagery hardware refresh.<br>- Initiate software and hardware consolidation studies to support the development of the Common Geospatial Intelligence Server.<br>- Initiate integration, testing and cyber security certification or National Geospatial Intelligence Agency's (NGA) iStore Integrated Product Library software into DCGS-MC Programs of Record.<br>- Initiate software development efforts to provide enhanced software capabilities within the current Enterprise DCGS Integration Backbone (DIB) Services (EDS) System baseline.<br>- Initiate integration, test and cyber security certification efforts to integrate Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal within the DCGS-MC Programs of Record.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Management Services - Engineering and Technical Services | 0.054 | 0.152 | 4.184 | 0.000 | 4.184 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The overall increase of $4.032M from FY17 to FY18 provides integration and interoperability testing of a Joint<br>Worldwide Intelligence Communications System (JWICS) Cross Doman Solution (CDS) that will be part of the DCGS<br>portfolio Approved Acquisition Objective and facilitate the ability to share higher level intelligence to a broader audience for analysis and action. Funding also addresses Joint Strike Fighter (JSF) requirements, including initiation and test efforts for approximately 35 Tactical Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms. Funding will be used to support the integration of Commercial Joint Mapping Toolkit (CJMTK) Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal to price data sharing and data management capability across | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Marine Expeditionary Forces/Intelligence (INTEL) Battalions and MCISRE Network architectures. Additionally, funds<br>will support integration and test efforts associated with geospatial intelligence (GEOINT) and imagery hardware refreshes of current fielded assets and testing and cyber security certification of National Geospatial Intelligence Agency's (NGA) iSTORE Software into the DCGC-MC Programs of Record (PoR). Specifically for EDS, intent is to provide an Enhanced Directory Monitor, Optical Character Recognition, Acronym Finder, Geospatial Extraction, and Metadata Entry Automation capability software enhancements. DCGS-MC will be multi-network capable, able to integrate with Intelligence databases and elements of the DoD DCGS Enterprise on JWICS and Coalition networks.<br><br>***FY 2016 Accomplishments:***<br>-Continued support for systems engineering, interoperability analysis, acquisition planning, and systems integration expertise.<br>-Continued support for research and development activities that impact the acquisition of military intelligence, surveillance, and reconnaissance systems.<br>***FY 2017 Plans:***<br>-Continued support for systems engineering, interoperability analysis, acquisition planning, and systems integration expertise.<br>-Continued support for research and development activities that impact the acquisition of military intelligence, surveillance, and reconnaissance systems.<br>- Initiate system requirement analysis and review for future software releases to include All Source Fusion (ASF) and Signals Intelligence (SIGINT).<br>- Initiate Requirements Traceability Mapping (RTM) for all DCGS-MC requirements to key performance parameters (KPPs), Key System Attributes (KSAs) through systems and sub-systems specifications and requirements.<br>- Initiate support for program Engineering Change Proposals (ECPs) as necessary.<br>- Initiate systems requirements review and utilize DIB Management Office (DMO) to refine all system requirements through the Requirements Development Process (RDP).<br>***FY 2018 Base Plans:***<br>-Continue support for systems engineering, interoperability analysis, acquisition planning, and systems integration expertise. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue support for research and development activities that impact the acquisition of military intelligence, surveillance, and reconnaissance systems.<br>-Continue system requirement analysis and review for future software releases to include ASF and SIGINT.<br>-Continue RTMs for all DCGS-MC requirements to KPPs, KSAs through systems and sub-systems specifications and requirements.<br>-Continue support for program ECPs as necessary.<br>-Continue systems requirements review and utilize DMO to refine all system requirements through the RDP.<br>-Initiate DCGS-MC GEOINT support for software integration of applications such as ArcGIS Portal, iSTORE, CJMTK, and ENVI.<br>-Initiate support for DCGS-MC GEOINT software enhancements as identified through configuration control board and engineering review boards in response to OPFOR requirements.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.105 | 2.100 | 12.867 | 0.000 | 12.867 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC 4767: *Distributed Common Ground System* | 1.947 | 15.031 | 13.462 | - | 13.462 | 14.542 | 11.516 | 10.775 | 11.043 | 0.000 | 123.828 |

**Remarks**

**D. Acquisition Strategy**

The Acquisition Strategy shall follow a hybrid approach consisting of a viable mix of alternatives that allows flexibility, agility and rapid fielding of new capabilities. An evolutionary acquisition approach will provide users with time-phased increments of capabilities that (while less than the full requirement), promote earlier delivery, improve affordability, and reduce risk. The evolutionary approach enables DCGS-MC to effectively assess and leverage emerging technologies to accelerate introduction into MCISR-E. The DCGS-MC capabilities will be fielded in increments through operational capability drops.

**E. Performance Metrics**

-Quarterly Dashboard Input
-IOC

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>2268 / *Distributed Common Ground System (DCGS-MC)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCGS PRIOR YEAR CUMMULATIVE FUNDING | Various | N/A : N/A | 55.765 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 55.765 | - |
| | | **Subtotal** | 55.765 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 55.765 | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCGS PRIOR YEAR CUMMULATIVE FUNDING | Various | N/A : N/A | 7.341 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.341 | - |
| | | **Subtotal** | 7.341 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.341 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCGS PRIOR YEAR CUMMULATIVE FUNDING | Various | N/A : N/A | 4.017 | 0.037 | Oct 2015 | 0.075 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 4.129 | - |
| DCGS | C/FFP | SSCA : Charleston, SC | 2.248 | 0.684 | Feb 2016 | 0.235 | Nov 2016 | 4.059 | Dec 2017 | - | | 4.059 | Continuing | Continuing | Continuing |
| EDS CDS Initial Capibility Enhancments | C/CPFF | SSCA : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 3.391 | Dec 2017 | - | | 3.391 | 0.000 | 3.391 | - |
| TPC Integration | C/CPFF | NSWC Crane : Crane, IN | 0.000 | 0.330 | Mar 2016 | 0.306 | Nov 2016 | 0.500 | Nov 2017 | - | | 0.500 | 0.000 | 1.136 | - |
| FMV-ONE Integration | WR | NRL : Washington DC | 0.000 | 0.000 | | 1.332 | Mar 2017 | 0.733 | Nov 2017 | - | | 0.733 | 0.000 | 2.065 | - |
| | | **Subtotal** | 6.265 | 1.051 | | 1.948 | | 8.683 | | - | | 8.683 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>2268 / *Distributed Common Ground System (DCGS-MC)* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks**

Increase of $6.735M in Test and Evaluation will provide for multiple integration and interoperability test events associated with the DCGS portfolio as indicated in the R2A.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCGS | MIPR | CECOM : Stafford, Va | 1.394 | 0.024 | Oct 2015 | 0.152 | Oct 2016 | 0.158 | Oct 2017 | - | | 0.158 | 0.000 | 1.728 | - |
| DCGS EDS | C/CPFF | SSCA : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 2.675 | Dec 2017 | - | | 2.675 | 0.000 | 2.675 | - |
| DCGS GEOINT | C/CPFF | SSCA : Charleston, SC | 0.000 | 0.000 | | 0.000 | | 1.351 | Dec 2017 | - | | 1.351 | 0.000 | 1.351 | - |
| DCGS | C/CPFF | DTIC : Ft Belvoir | 0.000 | 0.030 | Oct 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.030 | - |
| | | **Subtotal** | 1.394 | 0.054 | | 0.152 | | 4.184 | | - | | 4.184 | 0.000 | 5.784 | - |

**Remarks**

Increase of $4.032M in Management Services will support integration and test efforts associated with GEOINT and imagery hardware refreshes as indicated in the R2A.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 70.765 | 1.105 | | 2.100 | | 12.867 | | - | | 12.867 | - | - | - |

**Remarks**

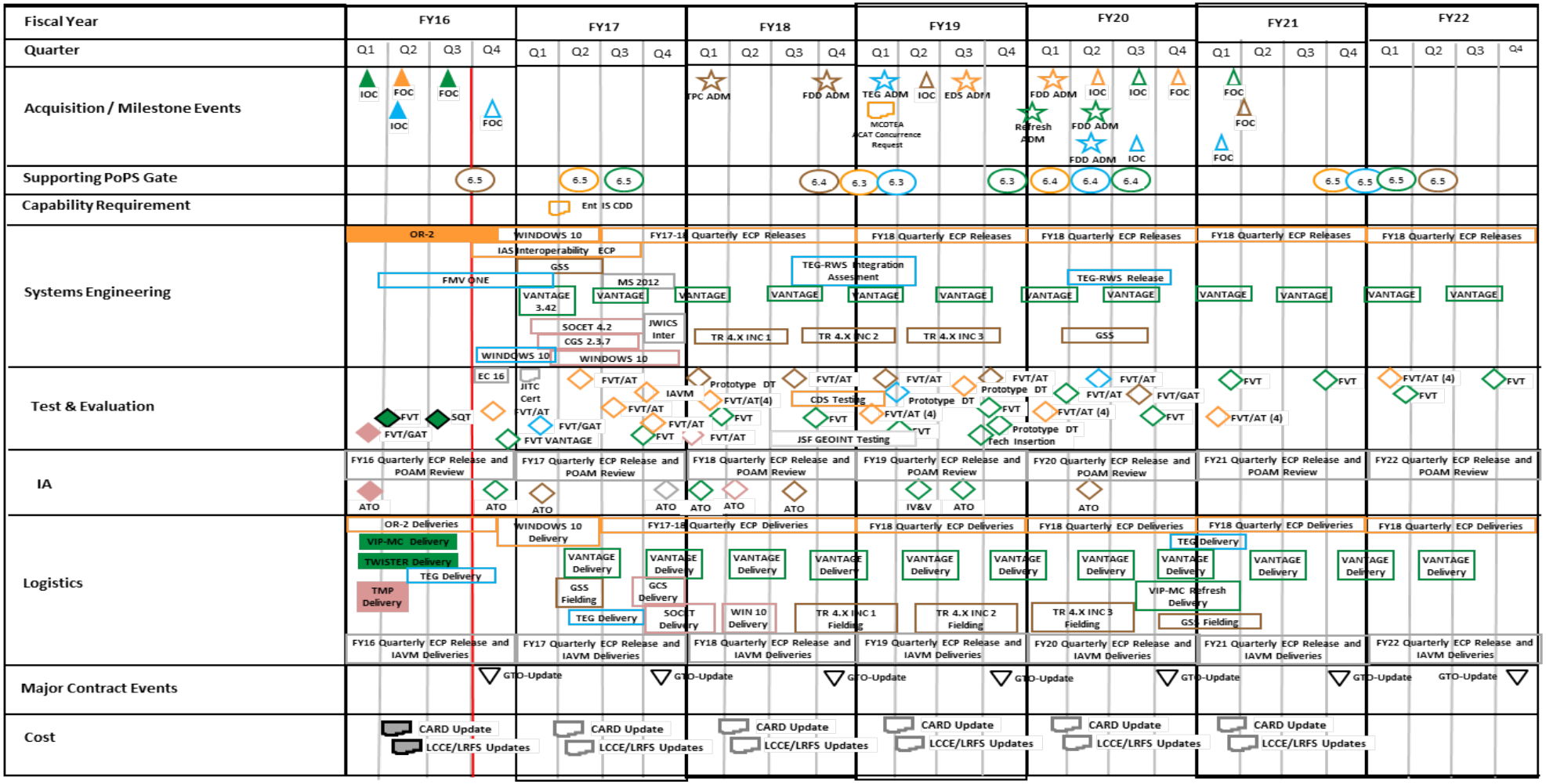
Increases in the DCGS cost categories 10.767M from FY17 to FY18 provide integration and interoperability testing of a Joint Worldwide Intelligence Communications System (JWICS) Cross Doman Solution (CDS) that will be part of the DCGS portfolio Approved Acquisition Objective and facilitate the ability to share higher level intelligence to a broader audience for analysis and action. Funding also addresses Joint Strike Fighter (JSF) requirements, including initiation and test efforts for approximately 35 Tactical Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms. Funding will be used to support the integration of Commercial Joint Mapping Toolkit (CJMTK) Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal to price data sharing and data management capability across Marine Expeditionary Forces/Intelligence (INTEL) Battalions and MCISRE Network architectures. Additionally, funds will support integration and test efforts associated with geospatial intelligence (GEOINT) and imagery hardware refreshes of current fielded assets and testing and cyber security certification of National Geospatial Intelligence Agency's (NGA) iSTORE Software into the DCGC-MC Programs of Record (PoR). Specifically for EDS, intent is to provide an Enhanced Directory Monitor, Optical Character Recognition, Acronym Finder, Geospatial Extraction, and Metadata Entry Automation

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | Project (Number/Name)<br>2268 / *Distributed Common Ground System (DCGS-MC)* | |

| | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

capability software enhancements. DCGS-MC will be multi-network capable, able to integrate with Intelligence databases and elements of the DoD DCGS Enterprise on JWICS and Coalition networks. The benefits of obtaining this for USMC are enhanced Intelligence sharing and fusion, greater awareness in the Joint/Coalition Environment, and contributes directly to the Joint Processing Exploitation Dissemination (JPED) effort.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208M / *(U)Distributed Common Ground/Surface Systems* | **Project (Number/Name)**<br>2268 / *Distributed Common Ground System (DCGS-MC)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2268*** | | | | |
| Fielding GEOINT TPC FOS (GSS) | 2 | 2017 | 4 | 2017 |
| Fielding DCGS-MC (EDS, TEG-RWS, TPC FoS, VIP-MC, TMP) Windows 10 upgrade | 4 | 2016 | 2 | 2017 |
| DCGS-MC GEOINT ECP Release (FY 17) | 1 | 2017 | 4 | 2017 |
| DCGS-MC GEOINT ECP Release (FY 18) | 1 | 2018 | 4 | 2018 |
| DCGS-MC GEOINT JSF Testing | 3 | 2018 | 2 | 2019 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305208N *I Distributed Common Ground Sys* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 203.481 | 23.149 | 44.571 | 46.150 | - | 46.150 | 48.207 | 42.293 | 36.333 | 38.158 | Continuing | Continuing |
| 2174: *Distributed Common Ground System-Navy (DCGS-N)* | 203.481 | 1.730 | 1.637 | 0.325 | - | 0.325 | 0.356 | 0.274 | 0.280 | 0.285 | Continuing | Continuing |
| 2227: *Distributed Common Ground System (DCGS-N) Inc 2* | 0.000 | 21.419 | 42.934 | 45.825 | - | 45.825 | 47.851 | 42.019 | 36.053 | 37.873 | 80.800 | 354.774 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** MN40, M464 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The Distributed Common Ground System - Navy (DCGS-N) is the Navy's portion of the Under Secretary of Defense, Intelligence (USD (I)) DCGS Family of Systems (FoS). The Department of Defense (DoD) has defined a DCGS architecture that will be compatible and interoperable across all of the Services' Intelligence, Surveillance and Reconnaissance (ISR) systems and operations. DCGS accesses and ingests data from space borne, airborne, subsurface, and surface ISR collection assets, intelligence databases and intelligence producers. This collected data is shared across a Joint enterprise using the DCGS Integration Backbone (DIB) and in time, the Defense Intelligence Information Enterprise (DI2E) to enhance access and sharing of ISR information across Joint forces through the use of common enterprise standards and services. DCGS FoS supports Joint Task Force (JTF)-level and below combat operations with critical intelligence for battle management and information dominance across the full spectrum of operations, including peace, conflict, war, and Overseas Contingency Operations (OCO). DCGS is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS-N core components include the Analyst Work Station from the Global Command and Control System (GCCS) - Integrated Imagery and Intelligence (I3), Generic Area Limitation Environment (GALE) Signal Intelligence (SIGINT), Common Geo-positioning Services (CGS), Image Product Library (IPL), Modernized Integrated Database (MIDB), Joint Concentrator Architecture (JCA) and Track Management Services.

The DCGS-N system represents the integration of 1) The processing and exploitation of tactical and Imagery Intelligence (IMINT) and SIGINT; 2) Precision target geopositioning, mensuration, and imagery dissemination capabilities; 3) Selected national IMINT requirements and processing capabilities from the National Geospatial-Intelligence Agency (NGA); and 4) Sharing of Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) and Command and Control information via DIB, DI2E, and Net-Centric Enterprise Services (NCES) standards with a wide range of customers (e.g., Global Command and Control System - Maritime (GCCS-M)), Joint Mission Planning System (JMPS), and many others.

The DCGS-N Enterprise Node (DEN), which incorporates current DIB standards and DI2E policy, facilitates interoperability and data sharing among the DCGS FoS. DCGS-N ensures compliance with the DoD DCGS network architecture.

The Navy is establishing an ISR Enterprise way ahead that will emphasize a reach back strategy to provide intelligence products to support deployed ship and shore operations. The Navy will also migrate to a Service Oriented Architecture (SOA) that requires the development, integration, and testing of a Maritime ISR Enterprise

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305208N *I Distributed Common Ground Sys* |

capability, development and migration of ISR SOA applications, and development and integration to leverage a Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE). Distributed Common Ground System - Navy (DCGS-N) will also become the focal point for migration of Maritime Domain Awareness (MDA) fusion and analysis Maritime Fusion & Analysis (MFAS) tool applications for the Navy. Additionally, ISR systems will play key roles in enabling the national-to-tactical integration necessary for an integrated maritime targeting capability in support of kinetic and non-kinetic fires.

Distributed Common Ground System-Navy (DCGS-N) Increment 2 addresses a critical shortfall in Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capability and capacity to support operational, tactical planning, and execution across the full range of joint military operations. Existing TCPED shortfalls will be exacerbated by planned Navy, Joint, and Allied fielding of new Intelligence Surveillance and Reconnaissance (ISR) platforms. Currently fielded systems provide localized processing capabilities that will be overwhelmed in future years without a significant change in the way the Navy processes, exploits and disseminates intelligence data. DCGS-N Increment 2 will deliver all source fusion and analytical capabilities; provide MDA capabilities and integrate TCPED capabilities to improve the use and analysis of sensor and platform data. DCGS-N Increment 2 will be based on an enterprise solution to share this information across commands, services, and agencies to promote shared situational awareness. DCGS-N Increment 2 consists of multiple releases. The first release provides an enhanced Navy ISR enterprise that converges and builds on the DCGS-N Increment 1 and Maritime Domain Awareness Enterprise Nodes; leverages the Defense Intelligence Information Enterprise (DI2E); is compliant with the Common Computing Environment (CCE) and the IC ITE; federates ISR and TCPED workflow and production improving throughout the automation; exploits new and evolving unmanned systems sensor data; provides Multi-Intelligence (Multi-INT) cross-queuing and modular tools. The second release enhances afloat ISR capabilities by providing a set of software centric tools providing Multi-INT fusion and analysis, behavior prediction and intelligent knowledge management designed to operate in disconnected or denied communications environment. Follow-on releases will be developed based on Fleet requirements.

In FY18, DCGS-N Increment 1 will continue supporting development, integration and regression testing required to align with emerging national imagery standards for tech refreshes and End-of-Life Upgrades.

In FY18, DCGS-N Increment 2 will complete development of Fleet Capability Release 1 (FCR-1) which comprises the ashore backbone of the Navy's Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) enterprise and will contain enterprise data and analytics and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. At the conclusion of development of FCR-1 the program will conduct an In Progress Test Review and integrated test of the of the FCR-1 build including rigorous cyber security testing culminating in a Fielding Technical Review to support the FCR-1 Fielding Decision Review in FY19. The program will begin planning for FCR-2 including developing the Requirements Definition Package (RDP), preparing for the Build Technical Review, and Build Decision. DGCS-N Increment 2 will begin Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting data.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0305208N *I Distributed Common Ground Sys* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 23.149 | 44.571 | 36.301 | - | 36.301 |
| Current President's Budget | 23.149 | 44.571 | 46.150 | - | 46.150 |
| Total Adjustments | 0.000 | 0.000 | 9.849 | - | 9.849 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 9.200 | - | 9.200 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.649 | - | 0.649 |

**Change Summary Explanation**

Technical: Distributed Common Ground System - Navy (DCGS-N) Increment 2 ($5.83M) program adjustment was added via tech change from within PE 0305208N to fund the program to the approved Component Cost Position (CCP) and updated schedule. Also, an increase ($4M) for Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting data.

Schedule: 1) DCGS-N Increment 2's development, milestones, and fielding have been updated to reflect a Milestone B approved schedule.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0305208N / *Distributed Common Ground Sys* | | | | Project (Number/Name)<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2174: *Distributed Common Ground System-Navy (DCGS-N)* | 203.481 | 1.730 | 1.637 | 0.325 | - | 0.325 | 0.356 | 0.274 | 0.280 | 0.285 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** MN40

**A. Mission Description and Budget Item Justification**

The Distributed Common Ground System - Navy (DCGS-N) is the Navy's portion of the Under Secretary of Defense, Intelligence (USD (I)) DCGS Family of Systems (FoS). The Department of Defense (DoD) has defined a DCGS architecture that will be compatible and interoperable across all of the Services' Intelligence, Surveillance and Reconnaissance (ISR) systems and operations. DCGS accesses and ingests data from space borne, airborne, subsurface, and surface ISR collection assets, intelligence databases and intelligence producers. This collected data is shared across a Joint enterprise using the DCGS Integration Backbone (DIB) and in time, the Defense Intelligence Information Enterprise (DI2E) to enhance access and sharing of ISR information across Joint forces through the use of common enterprise standards and services. DCGS FoS supports Joint Task Force (JTF)-level and below combat operations with critical intelligence for battle management and information dominance across the full spectrum of operations, including peace, conflict, war, and Overseas Contingency Operations (OCO). DCGS is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS-N core components include the Analyst Work Station from the Global Command and Control System (GCCS) - Integrated Imagery and Intelligence (I3), Generic Area Limitation Environment (GALE) Signal Intelligence (SIGINT), Common Geo-positioning Services (CGS), Image Product Library (IPL), Modernized Integrated Database (MIDB), Joint Concentrator Architecture (JCA) and Track Management Services.

The DCGS-N system represents the integration of 1) The processing and exploitation of tactical and Imagery Intelligence (IMINT) and SIGINT; 2) Precision target geopositioning, mensuration, and imagery dissemination capabilities; 3) Selected national IMINT requirements and processing capabilities from the National Geospatial-Intelligence Agency (NGA); and 4) Sharing of Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) and Command and Control information via DIB, DI2E, and Net-Centric Enterprise Services (NCES) standards with a wide range of customers (e.g., Global Command and Control System - Maritime (GCCS-M)), Joint Mission Planning System (JMPS), and many others.

The DCGS-N Enterprise Node (DEN), which incorporates current DIB standards and DI2E policy, facilitates interoperability and data sharing among the DCGS FoS. DCGS-N ensures compliance with the DoD DCGS network architecture.

The Navy is establishing an ISR Enterprise way ahead that will emphasize a reach back strategy to provide intelligence products to support deployed ship and shore operations. The Navy will also migrate to a Service Oriented Architecture (SOA) that requires the development, integration, and testing of a Maritime ISR Enterprise capability, development and migration of ISR SOA applications, and development and integration to leverage a Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE). Additionally, DCGS-N will become the focal point for migration of Maritime Domain Awareness (MDA) fusion and analysis Maritime Fusion & Analysis (MFAS) tool applications for the Navy.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* |

Distributed Common Ground System - Navy (DCGS-N) Increment 2 addresses a critical shortfall in Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capability and capacity to support operational, tactical planning, and execution across the full range of joint military operations. Existing TCPED shortfalls will be exacerbated by planned Navy, Joint, and Allied fielding of new Intelligence, Surveillance and Reconnaissance (ISR) platforms. Currently fielded systems provide localized processing capabilities that will be overwhelmed in future years without a significant change in the way the Navy processes, exploits and disseminates intelligence data. Distributed Common Ground System-Navy (DCGS-N) Increment 2 will deliver all source fusion and analytical capabilities; provide Maritime Domain Awareness (MDA) capabilities and integrate Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capabilities to improve the use and analysis of sensor and platform data. DCGS-N Increment 2 will be based on an enterprise solution to share this information across commands, services, and agencies to promote shared situational awareness. DCGS-N Increment 2 consists of multiple releases. The first release provides an enhanced Navy Intelligence, Surveillance and Reconnaissance (ISR) enterprise that converges and builds on the DCGS-N Increment 1 and Maritime Domain Awareness Enterprise Nodes; leverages the Defense Intelligence Information Enterprise (DI2E); is compliant with the Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE); federates ISR and TCPED workflow and production improving throughout the automation; exploits new and evolving unmanned systems sensor data; provides Multi-Intelligence (Multi-INT) cross-queuing and modular tools. The second release enhances afloat ISR capabilities by providing a set of software centric tools providing Multi-INT fusion and analysis, behavior prediction and intelligent knowledge management designed to operate in disconnected or denied communications environment. Follow-on releases will be developed based on Fleet requirements.

In FY18, DCGS-N Increment 1 will continue supporting development, integration and regression testing required to align with emerging national imagery standards for tech refreshes and End-of-Life Upgrades.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** DCGS-N Increment 1 | 1.730 | 1.637 | 0.325 | 0.000 | 0.325 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>DCGS-N Increment 1 completed Operational Testing of the Block 2 system and continued to develop, integrate, and perform regression testing required to align with emerging national imagery standards; completed integration into Block 2 Afloat and Ashore baselines. | | | | | |
| ***FY 2017 Plans:***<br>DCGS-N Increment 1 continues to develop, integrate, and perform regression testing required to align with emerging national imagery standards. In addition, DCGS-N Increment 1 to complete any statutory and regulatory requirements needed to meet national imagery standards. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| In FY18, DCGS-N Increment 1 will continue supporting development, integration and regression testing required to align with emerging national imagery standards for tech refreshes and End-of-Life Upgrades.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 1.730 | 1.637 | 0.325 | 0.000 | 0.325 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN 2914: *Distributed Common Ground System-Navy (DCGS-N)* | 31.809 | 24.676 | 13.790 | 6.392 | 20.182 | 13.005 | 10.995 | 23.107 | 16.472 | 242.100 | 589.983 |

**Remarks**

0305208N/2914 is a shared PE with Distributed Common Ground System-Navy (DCGS-N) Increment 1, Increment 2, and Intelligence Carry-On Program (ICOP)

**D. Acquisition Strategy**

DCGS-N program utilizes mature Commercial-Off-The-Shelf (COTS) and Governmental-Off-The-Shelf (GOTS) capabilities. The Navy adapts and integrates these capabilities and ensures interoperability with the DCGS Integration Backbone (DIB) standards and Defense Intelligence Information Enterprise (DI2E) policies. Integration of DCGS-N Increment 1 components has transitioned from Government-led to Industry-led based on the award of DCGS-N's Prime Mission Product (PMP) contract.

**E. Performance Metrics**

DCGS-N Increment 1 Goal: Meet national imagery standards.
DCGS-N Increment 1 Metric: Support development, integration and regression testing required to align with emerging national imagery standards.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development Prior Years | Various | Various : Various | 77.345 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 77.345 | - |
| Systems Engineering | WR | SSC LANT : Charleston, SC | 11.942 | 0.200 | Nov 2015 | 0.181 | Nov 2016 | 0.150 | Nov 2017 | - | | 0.150 | Continuing | Continuing | Continuing |
| Systems Engineering | C/CPFF | SETA SAIC : Columbia, MD | 9.210 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.210 | - |
| Systems Engineering | WR | SSC PAC : San Diego, CA | 11.027 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 11.027 | - |
| Integration Assembly & Test | C/CPFF | BAE : Rancho Bernardo, CA | 0.000 | 0.600 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.600 | - |
| Integration Assembly & Test | WR | SSC PAC : San Diego, CA | 0.000 | 0.150 | Nov 2015 | 0.100 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.250 | - |
| Integration Assembly & Test | C/CPFF | NSWC China Lake : China Lake, CA | 0.000 | 0.000 | | 0.600 | Jun 2017 | 0.100 | Nov 2017 | - | | 0.100 | 0.000 | 0.700 | - |
| Primary Hardware Development | WR | SSC PAC : San Diego, CA | 1.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.500 | - |
| Software Development | C/CPFF | BAE : Rancho Bernardo, CA | 2.460 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.460 | - |
| Software Development | WR | SSC PAC : San Diego, CA | 7.625 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.625 | - |
| Licenses | WR | SSC PAC : San Diego, CA | 0.100 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.100 | - |
| Government Technical Oversight (Dev) | WR | SSC LANT : Charleston, SC | 0.000 | 0.200 | Nov 2015 | 0.191 | Nov 2016 | 0.075 | Nov 2017 | - | | 0.075 | 0.000 | 0.466 | - |
| | | **Subtotal** | 121.209 | 1.150 | | 1.072 | | 0.325 | | - | | 0.325 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support Prior Years | Various | Various : Various | 35.073 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 35.073 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | C/CPFF | SETA SAIC : Columbia, MD | 4.281 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.281 | - |
| Development Support | WR | SSC LANT : Charleston, SC | 1.480 | 0.200 | Nov 2015 | 0.185 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.865 | - |
| Development Support | WR | SSC PAC : San Diego, CA | 1.200 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.200 | - |
| Integrated Logistics Support | WR | SSC PAC : San Diego, CA | 0.600 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.600 | - |
| Integrated Logistics Support | C/CPFF | SETA SAIC : Columbia, MD | 1.450 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.450 | - |
| Configuration Management | WR | SSC PAC : San Diego, CA | 1.300 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.300 | - |
| | | **Subtotal** | 45.384 | 0.200 | | 0.185 | | 0.000 | | - | | 0.000 | 0.000 | 45.769 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test & Evaluation Prior Years | Various | Various : Various | 19.103 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 19.103 | - |
| Developmental Test & Evaluation | WR | SSC LANT : Charleston, SC | 2.447 | 0.300 | Nov 2015 | 0.300 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 3.047 | - |
| Operational Test & Evaluation | C/CPFF | COTF : Norfolk, VA | 0.120 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.120 | - |
| Developmental Test & Evaluation | WR | SSC PAC : San Diego, CA | 3.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.500 | - |
| Developmental Test & Evaluation | C/CPFF | COTF : Norfolk, VA | 0.700 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.700 | - |
| | | **Subtotal** | 25.870 | 0.300 | | 0.300 | | 0.000 | | - | | 0.000 | 0.000 | 26.470 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* |

**Management Services ($ in Millions)**

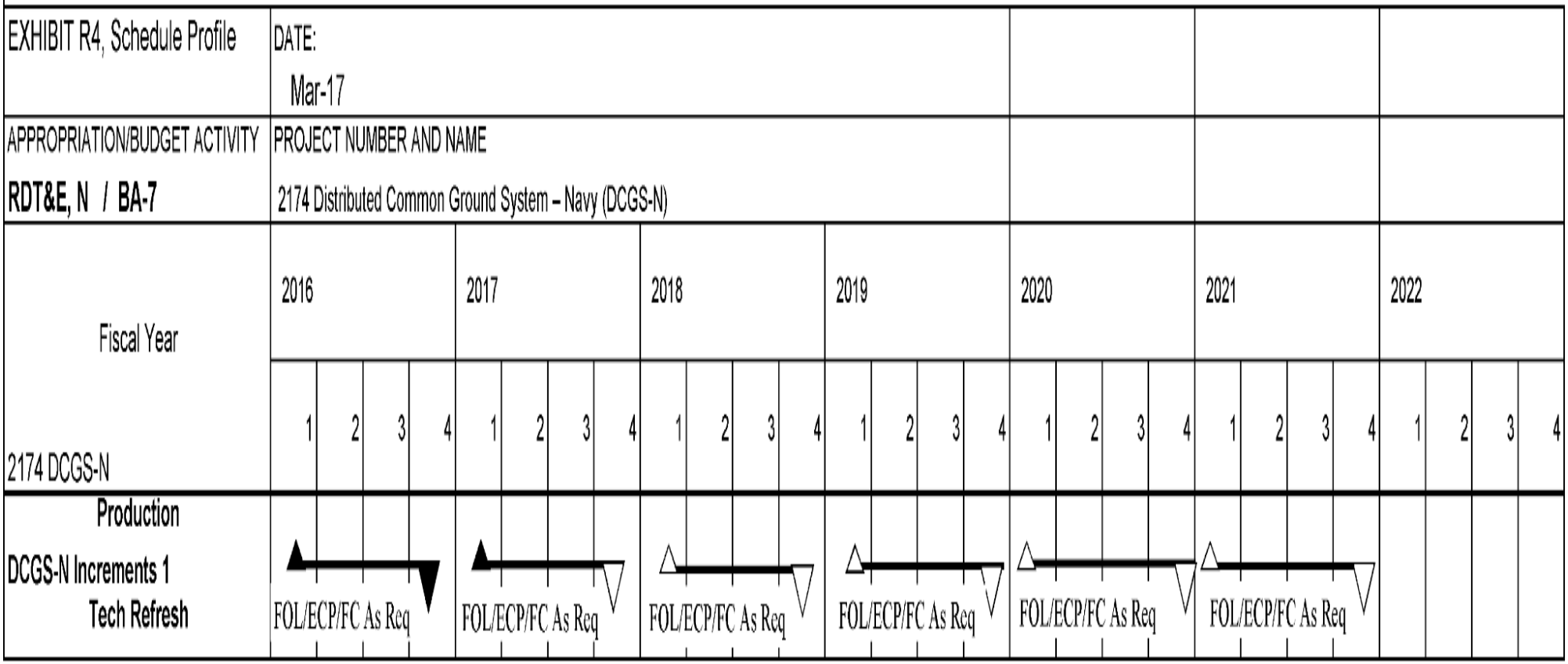
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Services Prior Years | Various | Various : Various | 3.374 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.374 | - |
| Travel | Allot | SPAWAR : San Diego, CA | 0.839 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.839 | - |
| Government Engineering Support | WR | SSC LANT : Charleston, SC | 1.484 | 0.080 | Nov 2015 | 0.080 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.644 | - |
| Program Management Support | C/CPFF | PSS BAH : San Diego, CA | 5.321 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.321 | - |
| | | **Subtotal** | 11.018 | 0.080 | | 0.080 | | 0.000 | | - | | 0.000 | 0.000 | 11.178 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 203.481 | 1.730 | | 1.637 | | 0.325 | | - | | 0.325 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* | |

CLASSIFICATION:



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>2174 / *Distributed Common Ground System-Navy (DCGS-N)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2174*** | | | | |
| DCGS-N Inc 1 Tech Refresh | 1 | 2016 | 4 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208N / *Distributed Common Ground Sys* | Project (Number/Name)<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2227: *Distributed Common Ground System (DCGS-N) Inc 2* | 0.000 | 21.419 | 42.934 | 45.825 | - | 45.825 | 47.851 | 42.019 | 36.053 | 37.873 | 80.800 | 354.774 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** M464

**Note**

Cost-To-Complete reflects Distributed Common Ground System - Navy (DCGS-N) Increment 2 only. DCGS-N Increment 2 reflects Department of Navy Component Cost Position (CCP).

**A. Mission Description and Budget Item Justification**

DCGS-N Increment 2 addresses a critical shortfall in Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capability and capacity to support operational, tactical planning, and execution across the full range of joint military operations. Existing TCPED shortfalls will be exacerbated by planned Navy, Joint, and Allied fielding of new Intelligence, Surveillance and Reconnaissance (ISR) platforms. Currently fielded systems provide localized processing capabilities that will be overwhelmed in future years without a significant change in the way the Navy processes, exploits and disseminates intelligence data. DCGS-N Increment 2 will deliver all source fusion and analytical capabilities; provide Maritime Domain Awareness (MDA) capabilities and integrate TCPED capabilities to improve the use and analysis of sensor and platform data. DCGS-N Increment 2 will be based on an enterprise solution to share this information across commands, services, and agencies to promote shared situational awareness. DCGS-N Increment 2 consists of multiple releases. The first release provides an enhanced Navy ISR enterprise that converges and builds on the DCGS-N Increment 1 and Maritime Domain Awareness Enterprise Nodes; leverages the Defense Intelligence Information Enterprise (DI2E); is compliant with the Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE); federates ISR and TCPED workflow and production improving throughout the automation; exploits new and evolving unmanned systems sensor data; provides Multi-Intelligence (Multi-INT) cross-queuing and modular tools. The second release enhances afloat ISR capabilities by providing a set of software centric tools providing Multi-INT fusion and analysis, behavior prediction and intelligent knowledge management designed to operate in disconnected or denied communications environment. Follow-on releases will be developed based on Fleet requirements.

In FY18, DCGS-N Increment 2 will complete development of Fleet Capability Release 1 (FCR-1); conduct an In Progress Test Review, and integrated test of the FCR-1 build including rigorous cyber security testing. The program will begin planning for FCR-2 including developing the Requirements Definition Package, preparing for the Build Technical Review, and Build Decision. DGCS-N Increment 2 will begin Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting data.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** DCGS-N Increment 2 | 21.419 | 42.934 | 45.825 | 0.000 | 45.825 |
| ***Articles:*** | - | - | 1 | - | 1 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>Distributed Common Ground System - Navy (DCGS-N) Increment 2 completed Joint Requirements Oversight Counsel (JROC) review and approval of the Information System Capability Development Document (IS CDD). The program successfully completed Milestone A (MS A), Development Request For Proposal (RFP) Decision Review, and Milestone B (MS B). Program successfully completed demonstration of Fleet Capability Release-0 (FCR-0) in support of the Program Executive Officer, Command, Control, Communications, Computers and Intelligence (PEO C4I) prototype.<br>***FY 2017 Plans:***<br>DCGS-N Increment 2 begins integration and development of Fleet Capability Release 1 (FCR-1) which will center on integrating Maritime Domain Awareness capabilities into DCGS-N Increment 2. Other development efforts include maritime object of interest track data management, correlation of limited data sources to maritime objects of interest, recognition of patterns of life from maritime objects of interest historical data, automate collection target area prediction; all with rigorous cyber security embedded into each facet of the capability. DCGS-N Increment 2 will award the Enterprise Integration Contract to fulfill the capability and capacity requirements of the Government Lead Systems Integrator for the remainder of FCR-1 development and integration and of FCR-2 and beyond.<br>***FY 2018 Base Plans:***<br>DCGS-N Increment 2 will complete development of FCR-1 which comprises the ashore backbone of the Navy's Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) enterprise and will contain enterprise data and analytics and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. DCGS-N Increment 2 will develop 1 unit for Environmental Qualification Testing (EQT). At the conclusion of development of FCR-1 the program will conduct an In Progress Test Review and integrated test of the of the FCR-1 build including rigorous cyber security testing culminating in a Fielding Technical Review to support the FCR-1 Fielding Decision Review in FY19. Other development efforts include maritime object of interest track data management, correlation of limited data sources to maritime objects of interest, recognition of patterns of life from maritime objects of interest historical data, automate collection target area prediction; all with rigorous cyber security embedded into each facet of the capability. DCGS-N Increment 2 will continue to develop a standard software baseline for the DCGS Family of Systems (FoS). DCGS-N will begin development and integration efforts to fuse ISR&T data collected, exploited and disseminated by ISR systems with other intelligence data and automatically provide to shipboard combat systems to support kinetic and non-kinetic fires and more effective exploitation of the electromagnetic spectrum. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ISR systems will play key roles in enabling the national-to-tactical integration necessary for an integrated maritime targeting capability in support of kinetic and non-kinetic fires. DCGS-N Increment 2 will begin planning for FCR-2 including approval of the Requirements Definition Package, Build Technical Review, and Build Decision. DCGS-N Increment 2 will begin establishing Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting data. Passive Targeting efforts include the transition to cloud architecture, development and enhancement of data models to ensure interoperability and compatibility with Intelligence Community (IC) and the install and test of developed capabilities. Distributed Common Ground System-Navy (DCGS-N) Increment 2 will continue to develop statutory/regulatory acquisition and training documentation as required.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 21.419 | 42.934 | 45.825 | 0.000 | 45.825 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN 2914: *Distributed Common Ground System-Navy (DCGS-N)* | 31.809 | 24.676 | 13.790 | 6.392 | 20.182 | 13.005 | 10.995 | 23.107 | 16.472 | 242.100 | 589.983 |

**Remarks**

0305208N/2914 is a shared PE with Distributed Common Ground System - Navy (DCGS-N) Increment 1, Increment 2, and Intelligence Carry-On Program (ICOP).

**D. Acquisition Strategy**

The DCGS-N Increment 2 acquisition is based on the Department of Defense Instruction (DODI) 5000.02, Model 3, for incrementally fielded software intensive programs.

**E. Performance Metrics**

DCGS-N Increment 2 Goal: Support afloat forces through a robust enterprise Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) capability, satisfying maritime needs for processing, exploitation, and dissemination.
DCGS-N Increment 2 Metric: Complete development of Fleet Capability Release 1 (FCR-1) and begin development of FCR 2.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integration Assembly & Test | WR | SSC PAC : San Diego, CA | 0.000 | 5.239 | Oct 2015 | 8.871 | Oct 2016 | 36.382 | Oct 2017 | - | | 36.382 | 0.000 | 50.492 | - |
| Primary Hardware Development | WR | SSC PAC : San Diego, CA | 0.000 | 2.833 | Oct 2015 | 8.648 | Oct 2016 | 2.735 | Oct 2017 | - | | 2.735 | 0.000 | 14.216 | - |
| Software Development | WR | SSC PAC : San Diego, CA | 0.000 | 8.723 | Oct 2015 | 19.329 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 28.052 | - |
| Integration Assembly & Test | C/CPFF | Unknown : Unknown | 0.000 | 0.000 | | 0.000 | | 0.125 | Jul 2018 | - | | 0.125 | 204.637 | 204.762 | - |
| Software Development | WR | SSC LANT : Charleston, SC | 0.000 | 0.504 | Oct 2015 | 1.131 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 1.635 | - |
| Government Technical Oversite (Dev) | WR | SSC LANT : Charleston, SC | 0.000 | 0.126 | Oct 2015 | 0.283 | Oct 2016 | 1.030 | Oct 2017 | - | | 1.030 | 0.000 | 1.439 | - |
| | | **Subtotal** | 0.000 | 17.425 | | 38.262 | | 40.272 | | - | | 40.272 | 204.637 | 300.596 | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | C/CPFF | SETA SAIC : Columbia, MD | 0.000 | 0.600 | Dec 2015 | 0.688 | Dec 2016 | 1.205 | Dec 2017 | - | | 1.205 | 0.000 | 2.493 | - |
| Development Support | WR | SSC LANT : Charleston, SC | 0.000 | 0.150 | Oct 2015 | 0.150 | Oct 2016 | 0.120 | Oct 2017 | - | | 0.120 | 13.622 | 14.042 | - |
| Integrated Logistics Support | WR | SSC LANT : Charleston, SC | 0.000 | 0.250 | Oct 2015 | 0.250 | Oct 2016 | 0.000 | | - | | 0.000 | 0.000 | 0.500 | - |
| Integrated Logistics Support | C/CPFF | SETA SAIC : Columbia, MD | 0.000 | 0.720 | Dec 2015 | 0.825 | Dec 2016 | 1.065 | Dec 2017 | - | | 1.065 | 0.000 | 2.610 | - |
| | | **Subtotal** | 0.000 | 1.720 | | 1.913 | | 2.390 | | - | | 2.390 | 13.622 | 19.645 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305208N / *Distributed Common Ground Sys* | Project (Number/Name)<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | SSC LANT : Charleston, SC | 0.000 | 0.250 | Oct 2015 | 0.287 | Oct 2016 | 0.910 | Oct 2017 | - | | 0.910 | 15.416 | 16.863 | - |
| Developmental Test & Evaluation | WR | SSC PAC : San Diego, CA | 0.000 | 0.800 | Oct 2015 | 0.917 | Oct 2016 | 0.500 | Oct 2017 | - | | 0.500 | 0.000 | 2.217 | - |
| Developmental Test & Evaluation | C/CPFF | COTF : Norfolk, VA | 0.000 | 0.200 | Nov 2015 | 0.386 | Nov 2016 | 0.200 | Nov 2017 | - | | 0.200 | 0.000 | 0.786 | - |
| | | **Subtotal** | 0.000 | 1.250 | | 1.590 | | 1.610 | | - | | 1.610 | 15.416 | 19.866 | - |

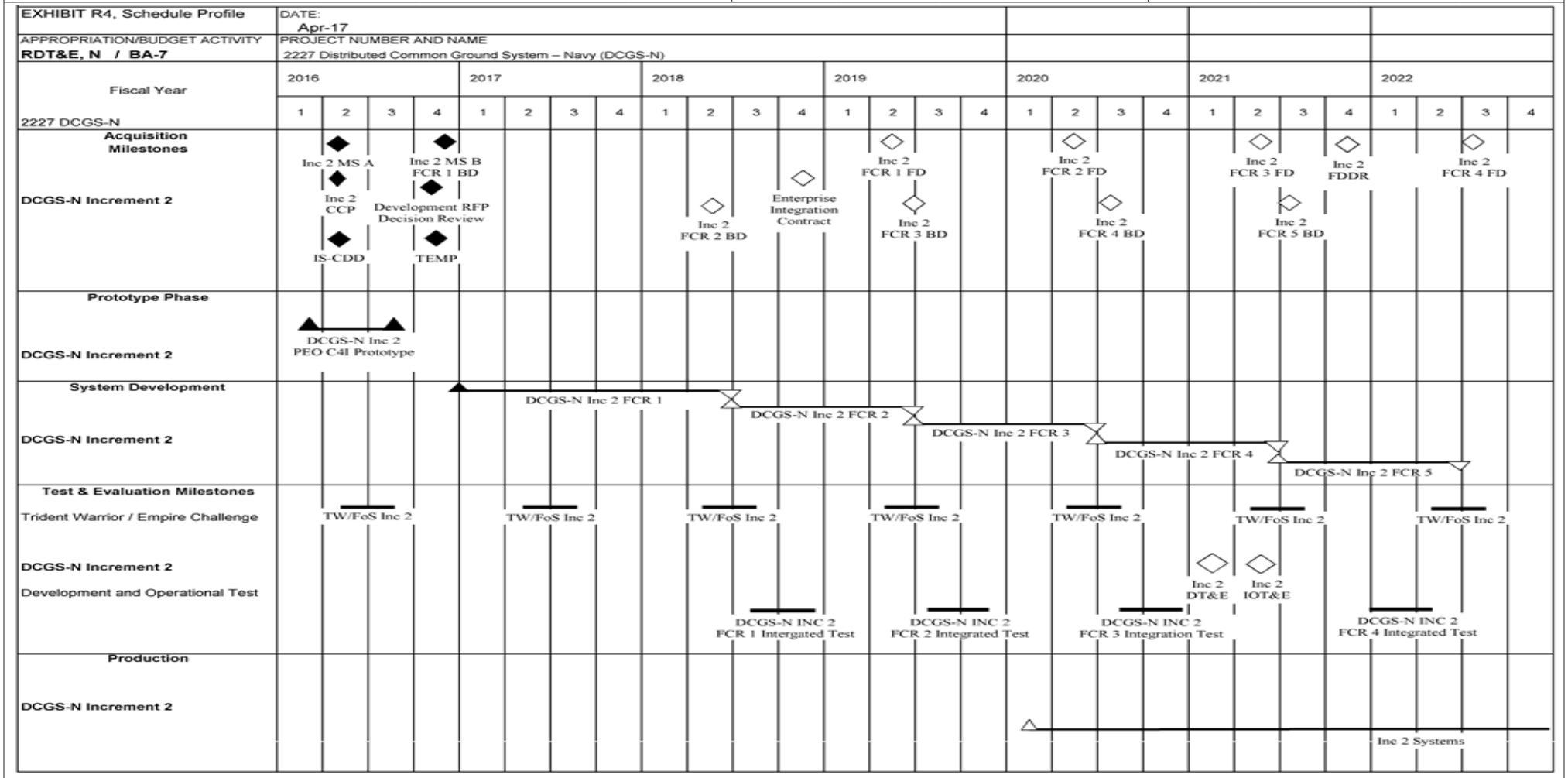
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Travel | Allot | SPAWAR : San Diego, CA | 0.000 | 0.100 | Nov 2015 | 0.206 | Nov 2016 | 0.240 | Nov 2017 | - | | 0.240 | 0.000 | 0.546 | - |
| Government Engineering Support | WR | SSC LANT : Charleston, SC | 0.000 | 0.154 | Nov 2015 | 0.154 | Nov 2016 | 0.388 | Nov 2017 | - | | 0.388 | 0.000 | 0.696 | - |
| Program Management Support | C/CPFF | PSS BAH : San Diego, CA | 0.000 | 0.270 | Nov 2015 | 0.309 | Nov 2016 | 0.400 | Nov 2017 | - | | 0.400 | 0.000 | 0.979 | - |
| Program Management Support | WR | SSC LANT : Charleston, SC | 0.000 | 0.300 | Oct 2015 | 0.300 | Oct 2016 | 0.300 | Oct 2017 | - | | 0.300 | 8.847 | 9.747 | - |
| Program Management Support | WR | SSC PAC : San Diego, CA | 0.000 | 0.200 | Oct 2015 | 0.200 | Oct 2016 | 0.225 | Oct 2017 | - | | 0.225 | 0.000 | 0.625 | - |
| | | **Subtotal** | 0.000 | 1.024 | | 1.169 | | 1.553 | | - | | 1.553 | 8.847 | 12.593 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 21.419 | | 42.934 | | 45.825 | | - | | 45.825 | 242.522 | 352.700 | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |



| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2227*** | | | | |
| Trident Warrior/DCGS Family of Systems Inc 2 2016 | 2 | 2016 | 3 | 2016 |
| Trident Warrior/DCGS Family of Systems Inc 2 2017 | 2 | 2017 | 3 | 2017 |
| Trident Warrior/DCGS Family of Systems Inc 2 2018 | 2 | 2018 | 3 | 2018 |
| Trident Warrior/DCGS Family of Systems Inc 2 2019 | 2 | 2019 | 3 | 2019 |
| Trident Warrior/DCGS Family of Systems Inc 2 2020 | 2 | 2020 | 3 | 2020 |
| DCGS-N Inc 2 FCR-1 Development | 1 | 2017 | 2 | 2018 |
| DCGS-N Inc 2 FCR-2 Development | 2 | 2018 | 2 | 2019 |
| DCGS-N Inc 2 FCR-3 Development | 2 | 2019 | 2 | 2020 |
| DCGS-N Inc 2 Release 1 Build Decision (MS B) | 4 | 2016 | 4 | 2016 |
| DCGS-N Inc 2 Procurement | 1 | 2020 | 4 | 2022 |
| DCGS-N Inc 2 FCR-1 Fielding Decision | 2 | 2019 | 2 | 2019 |
| DCGS-N Inc 2 FCR-2 Build Decision | 2 | 2018 | 2 | 2018 |
| DCGS-N Inc 2 FCR-3 Build Decision | 2 | 2019 | 2 | 2019 |
| DCGS-N Inc 2 IOT&E | 2 | 2021 | 2 | 2021 |
| DCGS-N Inc 2 FCR-2 Fielding Decision | 2 | 2020 | 2 | 2020 |
| DCGS-N Inc 2 FCR-3 Fielding Decision | 2 | 2021 | 2 | 2021 |
| DCGS-N Inc 2 FCR-0 PEO C4I Prototype | 1 | 2016 | 3 | 2016 |
| DCGS-N Inc 2 FCR-1 Integrated Test | 3 | 2018 | 4 | 2018 |
| DCGS-N Inc 2 FCR-2 Integrated Test | 3 | 2019 | 4 | 2019 |
| DCGS-N Inc 2 FCR-3 Integrated Test | 3 | 2020 | 4 | 2020 |
| DCGS-N Inc 2 FCR-4 Development | 2 | 2020 | 2 | 2021 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305208N / *Distributed Common Ground Sys* | **Project (Number/Name)**<br>*2227 / Distributed Common Ground System (DCGS-N) Inc 2* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| DCGS-N Inc 2 FCR-4 Build Decision | 3 | 2020 | 3 | 2020 |
| DCGS-N Inc 2 TEMP | 4 | 2016 | 4 | 2016 |
| DCGS-N Inc 2 IS-CDD | 2 | 2016 | 2 | 2016 |
| DCGS-N Inc 2 DEV RFP Decision | 4 | 2016 | 4 | 2016 |
| DCGS-N Inc 2 CCP | 2 | 2016 | 2 | 2016 |
| DCGS-N Inc 2 FDDR | 4 | 2021 | 4 | 2021 |
| DCGS-N Inc 2 FCR-5 Build Decision | 3 | 2021 | 3 | 2021 |
| DCGS-N Inc 2 FCR-5 Development | 2 | 2021 | 2 | 2022 |
| DCGS-N Inc 2 MS A | 2 | 2016 | 2 | 2016 |
| DCGS-N Inc 2 DT&E | 1 | 2021 | 1 | 2021 |
| Trident Warrior/DCGS Family of Systems Inc 2 2021 | 2 | 2021 | 3 | 2021 |
| Trident Warrior/DCGS Family of Systems Inc 2 2022 | 2 | 2022 | 3 | 2022 |
| DCGS-N Inc 2 FCR-4 Integrated Test | 1 | 2022 | 2 | 2022 |
| Enterprise Integration Contract | 4 | 2018 | 4 | 2018 |
| DCGS-N Inc 2 FCR-4 Fielding Decision | 3 | 2022 | 3 | 2022 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305220N *I (U)MQ-4C Triton* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 2,921.000 | 237.118 | 111.729 | 84.115 | - | 84.115 | 17.604 | 15.965 | 11.577 | 14.288 | 0.000 | 3,413.396 |
| 4020: *MQ-4C TRITON* | 2,921.000 | 237.118 | 111.729 | 84.115 | - | 84.115 | 17.604 | 15.965 | 11.577 | 14.288 | 0.000 | 3,413.396 |

**Program MDAP/MAIS Code:**
**Project MDAP/MAIS Code(s):** 373

**Note**

MQ-4C Triton RDTE funding for modernization was segregated into a new program element (from PE 0305220N to PE 0305421N) in order to satisfy Congressional direction for increased transparency.

In February 2017 an ATR added $116.7M FY16 RDTE,N to project 4020 MQ-4C Triton to fund Product Development and Test efforts. The reprogramming in not reflected in the budget values above. To reflect the correct funding profile, the CTC value should read 116.7 for a total cost of 3,534.527.

**A. Mission Description and Budget Item Justification**

MQ-4C Triton Unmanned Air System (UAS). The popular name Triton was approved for the MQ-4C UAS in June 2012, designating the RQ-4 Broad Area Maritime Surveillance (BAMS) UAS as the MQ-4C Triton.

The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's FORCEnet strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305220N *I (U)MQ-4C Triton* |

MQ-4C will play a significant role in the Sea Shield and FORCEnet pillars of Sea Power 21. In its Sea Shield role, the system will rely on its key attribute of persistence to provide the supported combatant command or fleet commander with unparalleled situational awareness of the maritime battle space as it develops and sustains the common operational tactical picture. The system will also serve as a Fleet response plan enabler, while acting as a trip wire for intelligence preparation of the environment. Additionally, Triton UAS will be a FORCEnet enabler and relay platform, directly connected to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 227.118 | 111.729 | 9.021 | - | 9.021 |
| Current President's Budget | 237.118 | 111.729 | 84.115 | - | 84.115 |
| Total Adjustments | 10.000 | 0.000 | 75.094 | - | 75.094 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 10.000 | 0.000 | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 74.800 | - | 74.800 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.294 | - | 0.294 |

**Change Summary Explanation**

The Triton program was revised to align key program events and funding ($74.8M) with the development of the Multi-INT capability upgrade in order to continue to support the Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan. Key Performance Parameters and Key System Attributes were not affected and capabilities essential to FY11 National Defense Authorization Act compliance is prioritized. To preserve the MISR&T transition plan, the Navy is prioritizing remaining work and adjusting the Triton fielding plan by:

1) Truncating the Triton Baseline program to deliver a safe, stable, and effective system that establishes the foundation for Triton Multi-INT development; and provides an early operational capability to facilitate Fleet introduction and learning in FY18.

2) Retrofitting low-rate initial production (LRIP) lot 1 and 2 air vehicles (Baseline) to a Multi-INT configuration upon delivery. Retrofit of LRIP lot 1 and 2 increases Triton Multi-INT capacity from three to five air vehicles by the end of FY20.

3) Deploying a Triton Multi-INT early operational capability in FY20.

4) Deferring initial operational test and evaluation and initial operational capability to the Multi-INT configuration in FY20/21.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305220N / *(U)MQ-4C Triton* | Project (Number/Name)<br>4020 / *MQ-4C TRITON* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4020: *MQ-4C TRITON* | 2,921.000 | 237.118 | 111.729 | 84.115 | - | 84.115 | 17.604 | 15.965 | 11.577 | 14.288 | 0.000 | 3,413.396 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 373

**A. Mission Description and Budget Item Justification**

MQ-4C Triton Unmanned Air System (UAS). The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's FORCEnet strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the OPNAV N2/N6 Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

MQ-4C will play a significant role in the Sea Shield and FORCEnet pillars of Sea Power 21. In its Sea Shield role, the system will rely on its key attribute of persistence to provide the supported combatant command or fleet commander with unparalleled situational awareness of the maritime battle space as it develops and sustains the common operational tactical picture. The system will also serve as a Fleet response plan enabler, while acting as a trip wire for intelligence preparation of the environment. Additionally, Triton UAS will be a FORCEnet enabler and relay platform, directly connected to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 185.404 | 88.098 | 73.568 | 0.000 | 73.568 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** Awarded contract in FY08 to initiate the MQ-4C Triton System Development and Demonstration phase effort. The Prime Contractor is responsible for overall system development and performance, as well as associated management, engineering and logistics activities.<br><br>***FY 2016 Accomplishments:***<br>Continue System Development and Demonstration (SDD) and build of two System Demonstration Test Article (SDTA) vehicles. Funding decreases from FY15 to reflect a ramp down in baseline MQ-4C Triton SDD development efforts in accordance with the program schedule.<br><br>***FY 2017 Plans:***<br>Continue SDD and delivery of two SDTA vehicles. Funding decreases from FY16 to reflect a ramp down in baseline MQ-4C Triton SDD development efforts in accordance with the program schedule.<br><br>***FY 2018 Base Plans:***<br>Continue SDD. Funding decreases from FY17 to reflect a ramp down in baseline MQ-4C Triton SDD development efforts in accordance with the program schedule.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** ILS, Support, Studies & Analysis | 16.982 | 0.725 | 0.325 | 0.000 | 0.325 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Integrated Logistics Support, Studies and Analysis.<br><br>***FY 2016 Accomplishments:***<br>Continue integrated logistics support, technical engineering services, sensor risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton Unmanned Air System (UAS) capabilities.<br><br>***FY 2017 Plans:***<br>Continue integrated logistics support, technical engineering services, sensor risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS capabilities.<br><br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue integrated logistics support, technical engineering services, sensor risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS capabilities.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test & Evaluation (T&E)<br>***Articles:***<br>***Description:*** T&E efforts.<br>***FY 2016 Accomplishments:***<br>Continue Developmental Testing (DT) and Operational Testing (OT) support activities to allow test and fielding of the MQ-4C Triton Unmanned Air System (UAS) in accordance with the program schedule.<br>***FY 2017 Plans:***<br>Continue DT and OT support activities to allow test and fielding of the MQ-4C Triton UAS in accordance with the program schedule.<br>***FY 2018 Base Plans:***<br>Continue DT and OT support activities to allow test and fielding of the MQ-4C Triton UAS in accordance with the program schedule.<br>***FY 2018 OCO Plans:***<br>N/A | 30.861<br>- | 22.799<br>- | 10.184<br>- | 0.000<br>- | 10.184<br>- |
| ***Title:*** Program Management (PM)<br>***Articles:***<br>***Description:*** PM support and travel.<br>***FY 2016 Accomplishments:***<br>Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability<br>assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, | 3.871<br>- | 0.107<br>- | 0.038<br>- | 0.000<br>- | 0.038<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international<br>cooperation efforts.<br>***FY 2017 Plans:***<br>Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability<br>assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning,<br>technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international<br>cooperation efforts.<br>***FY 2018 Base Plans:***<br>Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability<br>assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning,<br>technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international<br>cooperation efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 237.118 | 111.729 | 84.115 | 0.000 | 84.115 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN-4/044200: *MQ-4 Triton* | 619.662 | 464.657 | 579.369 | - | 579.369 | 681.233 | 588.256 | 622.602 | 611.734 | 6,654.217 | 10,902.900 |
| • MILCON/0212176N: *Facilities New Footprint - Fleet Ops* | 8.296 | 30.475 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 88.385 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN-6/060500: *Spares and Repair Parts* | 103.954 | 114.529 | 57.136 | - | 57.136 | 39.009 | 26.238 | 1.839 | 0.000 | 0.000 | 342.705 |
| • MILCON/0712876N: *Facilities New Footprint - Main and Prod* | 40.641 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 27.686 | 0.000 | 0.000 | 68.327 |
| • RDT&E/0305421N: *(U)RQ-4 Modernization* | 119.892 | 181.266 | 229.404 | - | 229.404 | 176.195 | 123.890 | 89.740 | 71.544 | 0.000 | 1,021.931 |
| • MILCON/0815976N: *Facilities New Footprint - Training* | 0.000 | 41.380 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 79.411 |
| • MILCON/0805976N: *Facilities Restoration and Mod-Training* | 2.974 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.974 |
| • APN-5/059600: *MQ-4 Series* | 0.000 | 0.000 | 39.996 | - | 39.996 | 43.947 | 7.874 | 0.000 | 0.000 | 0.000 | 91.817 |
| • OMN/1D4D: *Weapons Maintenance* | 0.000 | 0.000 | 13.367 | - | 13.367 | 20.476 | 36.902 | 130.093 | 151.932 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The MQ-4C Triton acquisition approach supports the Navy's Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan by providing a stable and effective baseline early operational capability in FY18 to facilitate Fleet introduction and learning while continuing System Development and Demonstration engineering and integrated test on Signals Intelligence (SIGINT) and other upgrades to deliver a Multi-INT configuration at Initial Operational Capability (IOC). Phased capability upgrades will continue post IOC to enable the MQ-4C Triton to keep pace with rapidly evolving technologies and threats, and address correction of deficiencies and obsolescence issues to ensure the Navy maintains persistent Intelligence, Surveillance and Reconnaissance dominance through the system's lifecycle.

The MQ-4C Triton program office is pursuing joint efficiency with the Air Force on the Global Hawk Unmanned Aircraft System (UAS). However, the integration of the Triton UAS into the Maritime Patrol Reconnaissance Force and the unique maritime sensors employed dictate a Navy-led acquisition program focused on joint efficiencies, where possible.

**E. Performance Metrics**

Successfully achieved Milestone C, Integrated Test, Operational Evaluation and IOC.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | C/CPIF | Northrop Grumman : Rancho Bernardo, CA | 2,417.962 | 147.174 | Jan 2016 | 83.788 | Nov 2016 | 71.558 | Nov 2017 | - | | 71.558 | 47.166 | 2,767.648 | 2,767.648 |
| Systems Engineering | Various | Various : Various | 14.863 | 4.158 | Nov 2015 | 0.010 | Nov 2016 | 0.010 | Nov 2017 | - | | 0.010 | 0.000 | 19.041 | - |
| Systems Engineering | WR | NAWC-AD : Patuxent River, MD | 203.829 | 30.516 | Nov 2015 | 4.300 | Nov 2016 | 2.000 | Nov 2017 | - | | 2.000 | 4.000 | 244.645 | - |
| Systems Engineering | WR | NAWC-WD : China Lake, CA | 10.909 | 2.509 | Nov 2015 | 0.000 | Nov 2016 | 0.000 | Nov 2017 | - | | 0.000 | 0.000 | 13.418 | - |
| Contractor Engineering | C/CPFF | Mitre : Mclean, VA | 2.997 | 1.047 | Nov 2015 | 0.000 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 4.044 | 4.044 |
| Prior Year Prod Dev no longer in the FYDP | Various | Various : Various | 24.553 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 24.553 | - |
| | | **Subtotal** | 2,675.113 | 185.404 | | 88.098 | | 73.568 | | - | | 73.568 | 51.166 | 3,073.349 | - |

**Remarks**

The Primary Hardware Development line resources Northrop Grumman for prime contractor activities, which include System Development and Demonstration (SDD) and System Demonstration Test Article (SDTA) vehicles.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | Various | Various : Various | 19.713 | 1.839 | Nov 2015 | 0.000 | Nov 2016 | 0.000 | Nov 2017 | - | | 0.000 | 0.000 | 21.552 | - |
| Integrated Logistics Support | Various | Various : Various | 14.151 | 9.659 | Nov 2015 | 0.025 | Nov 2016 | 0.025 | Nov 2017 | - | | 0.025 | 0.020 | 23.880 | - |
| Integrated Logistics Support | WR | NAWC-AD : Patuxent River, MD | 48.175 | 5.484 | Nov 2015 | 0.700 | Nov 2016 | 0.300 | Nov 2017 | - | | 0.300 | 1.200 | 55.859 | - |
| Prior year cost no longer funded in the FYDP | Various | Various : Various | 10.784 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.784 | - |
| | | **Subtotal** | 92.823 | 16.982 | | 0.725 | | 0.325 | | - | | 0.325 | 1.220 | 112.075 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305220N / *(U)MQ-4C Triton* | Project (Number/Name)<br>4020 / *MQ-4C TRITON* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | Various | Various : Various | 17.590 | 0.668 | Nov 2015 | 1.540 | Nov 2016 | 0.695 | Nov 2017 | - | | 0.695 | 0.000 | 20.493 | - |
| Developmental Test & Evaluation | WR | NAWC-AD : Patuxent River, MD | 92.696 | 27.675 | Nov 2015 | 19.000 | Nov 2016 | 8.140 | Nov 2017 | - | | 8.140 | 11.136 | 158.647 | - |
| Operational Test & Evaluation | Various | Various : Various | 1.371 | 0.761 | Nov 2015 | 1.001 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | 0.000 | 4.133 | - |
| Developmental Test & Evaluation (SATCOMM) | MIPR | DITCO : Various | 8.792 | 1.757 | Nov 2015 | 1.258 | Nov 2016 | 0.349 | Nov 2017 | - | | 0.349 | 0.256 | 12.412 | - |
| | | **Subtotal** | 120.449 | 30.861 | | 22.799 | | 10.184 | | - | | 10.184 | 11.392 | 195.685 | - |

**Management Services ($ in Millions)**

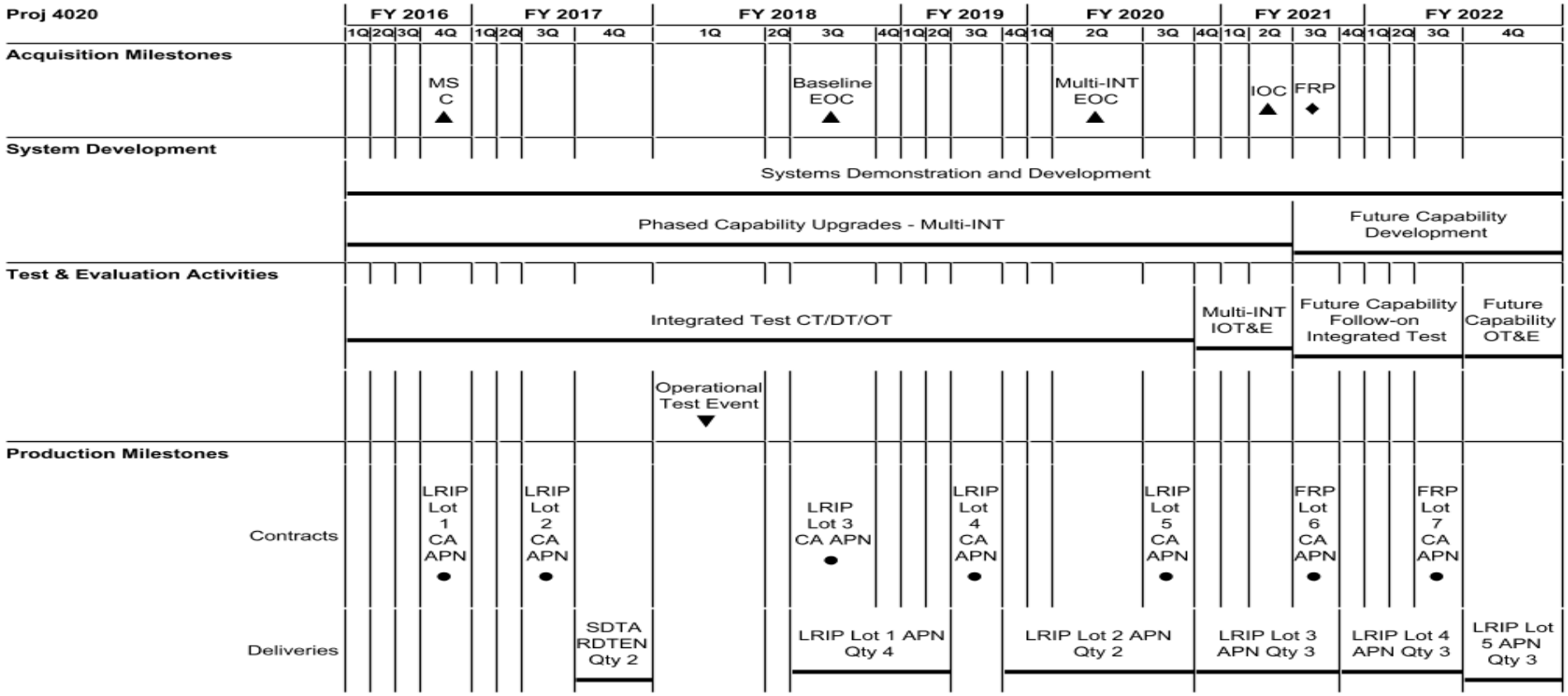
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | Various | Various : Various | 3.344 | 0.163 | Nov 2015 | 0.000 | Nov 2016 | 0.000 | Nov 2017 | - | | 0.000 | 0.000 | 3.507 | - |
| Travel | Allot | Various : Various | 1.528 | 0.119 | Nov 2015 | 0.107 | Nov 2016 | 0.038 | Nov 2017 | - | | 0.038 | 0.087 | 1.879 | - |
| Program Management Support | C/CPFF | Ausley : Lexington Park, MD | 22.735 | 3.589 | Nov 2015 | 0.000 | Nov 2016 | 0.000 | Nov 2017 | - | | 0.000 | 0.000 | 26.324 | 26.324 |
| Prior year cost no longer funded in the FYDP | Various | Various : Various | 5.008 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.008 | - |
| | | **Subtotal** | 32.615 | 3.871 | | 0.107 | | 0.038 | | - | | 0.038 | 0.087 | 36.718 | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 2,921.000 | 237.118 | | 111.729 | | 84.115 | | - | | 84.115 | 63.865 | 3,417.827 | - |

**Remarks**

Prior to FY10, MQ-4C Triton, formerly known as RQ-4 Broad Area Maritime Surveillance (BAMS), was budgeted for in PE 0305205N: Endurance Unmanned Aer Veh.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |




*2018DON - 0305220N - 4020 MQ-4C Triton development activities are resourced by PE 0305220N and PE 0305421N.*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 4020*** | | | | |
| Acquisition Milestones: Milestone C | 4 | 2016 | 4 | 2016 |
| Acquisition Milestones: Full Rate Production | 3 | 2021 | 3 | 2021 |
| Acquisition Milestones: Initial Operational Capability | 2 | 2021 | 2 | 2021 |
| Acquisition Milestones: Multi-INT Early Operational Capability | 2 | 2020 | 2 | 2020 |
| Acquisition Milestones: Baseline Early Operational Capability | 3 | 2018 | 3 | 2018 |
| System Development: System Development and Demonstration | 1 | 2016 | 4 | 2022 |
| System Development: Phased Capability Upgrades - Multi-INT | 1 | 2016 | 2 | 2021 |
| System Development: Future Capability Development | 3 | 2021 | 4 | 2022 |
| Test & Evaluation Activities: Integrated Test (Combined/Developmental/Operational) | 1 | 2016 | 3 | 2020 |
| Test & Evaluation Activities: Multi-INT Initial Operational Test and Evaluation | 4 | 2020 | 2 | 2021 |
| Test & Evaluation Activities: Future Capabilities Follow-on Integrated Test | 3 | 2021 | 3 | 2022 |
| Test & Evaluation Activities: Future Capabilities Operational Test and Evaluation | 4 | 2022 | 4 | 2022 |
| Test & Evaluation Activities: Operational Test Event | 1 | 2018 | 1 | 2018 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 1 Contract Award | 4 | 2016 | 4 | 2016 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 2 Contract Award | 3 | 2017 | 3 | 2017 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 3 Contract Award | 3 | 2018 | 3 | 2018 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 4 Contract Award | 3 | 2019 | 3 | 2019 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 5 Contract Award | 3 | 2020 | 3 | 2020 |
| Production Milestones: Contracts: Full Rate Production Lot 6 Contract Award | 3 | 2021 | 3 | 2021 |
| Production Milestones: Contracts: Full Rate Production Lot 7 Contract Award | 3 | 2022 | 3 | 2022 |
| Production Milestones: Deliveries: System Demonstration Test Articles Delivery | 4 | 2017 | 4 | 2017 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 1 Delivery | 3 | 2018 | 2 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305220N / *(U)MQ-4C Triton* | **Project (Number/Name)**<br>4020 / *MQ-4C TRITON* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 2 Delivery | 4 | 2019 | 3 | 2020 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 3 Delivery | 4 | 2020 | 3 | 2021 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 4 Delivery | 4 | 2021 | 3 | 2022 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 5 Delivery | 4 | 2022 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305231N *I MQ-8 UAV* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 411.245 | 52.770 | 26.518 | 62.656 | - | 62.656 | 19.952 | 26.533 | 28.775 | 22.213 | 88.512 | 739.174 |
| 2768: *MQ-8 Fire Scout* | 411.245 | 52.770 | 26.518 | 62.656 | - | 62.656 | 19.952 | 26.533 | 28.775 | 22.213 | 88.512 | 739.174 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 253 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

Note: This budget prioritizes system wholeness to ensure program of record capabilities are fully integrated and support fleet requirements. System wholeness supports completion of MQ-8C operational test requirements, development of radar, weapons, and other payloads, and component redesign required to maintain system hardware.

The MQ-8 Unmanned Air System is a Joint Military Intelligence Program.

The MQ-8 Unmanned Air System is popularly known as "Fire Scout". The Department conducted a Title 10 Section 2433 (Nunn-McCurdy Breach) review on the MQ-8 program in 2014 due to a unit cost breach and certified a restructured program to Congress on 16 June 2014. The restructured program includes MQ-8B air vehicles procured under the original program of record (POR), MQ-8C air vehicles (Endurance Upgrade) procured under the Department of the Navy's Rapid Deployment Capability (RDC) procurement process, and additional MQ-8C air vehicles to be procured to complete the program Fleet requirements, and associated Mission Control Systems (MCS), Unmanned Aerial Vehicle Common Automatic Recovery Systems (UCARS) and support equipment. In addition to the air vehicles, Radar and Weapons capabilities were developed under the Navy's RDC authorities. All acquisition actions previously planned under the RDCs have transitioned into the restructured POR. Current FY16 analysis has determined that a total fleet requirement of 60 air vehicles (51 procurement and 9 RDT&EN / 30 MQ-8Bs and 30 MQ-8Cs) will satisfy current needs thus reducing the total number of MQ-8C production air vehicles to a quantity of 30, a decrement of 10 from previous budget submits.

The MQ-8B-based system achieved Milestone C (MS C) in May 2007. The Nunn-McCurdy certification process revoked the program's MS C approval. MS C for the restructured MQ-8 program is currently scheduled for FY 2017.

The MQ-8 System provides real-time and non-real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or reliance on limited joint theater or national assets. The baseline MQ-8 can accomplish missions including over-the-horizon tactical reconnaissance, classification, targeting and laser designation and battle damage assessment (including voice communications relay). Development efforts respond to emerging fleet requirements through integration and improvements to Common Operational Picture capabilities, avionics, payloads, range, endurance, and targeting.

The MQ-8 launches and recovers vertically, and can operate from suitably-equipped air capable ships, as well as confined area land bases. Interoperability is achieved through the use of the Tactical Control System (TCS) software in the MCS, also referred to as a Ground Control Station (GCS), and through the use of the Tactical

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305231N *I MQ-8 UAV* |

Common Data Link (TCDL). The data from the MQ-8 is provided through standard DoD Command, Control, Communications, Computers and ISR (C4ISR) system architectures and protocols.

A deployed MQ-8 system includes air vehicle(s), payloads (i.e. electro-optical/infrared/laser designator-range finder, Automated Identification System, voice communications relay, Radar, Weapons, and other specialty payloads), MCS (with TCS and TCDL integrated for interoperability), a UCARS for automatic launch and recovery, and associated spares and support equipment. The schedules for MCS and UCARS components are based on host ship requirements, while schedules for air vehicle components, support equipment, and training equipment are based on operational deployment plans. A limited number of land-based mission control systems supplement the shipboard systems to support shore-based operations, such as pre-deployment or acceptance functional check flights. These land-based mission control stations will also support depot-level maintenance/post-maintenance activities. The MQ-8C provides additional mission endurance and payload-weight-power, increased reliability, and improved maintainability to the MQ-8 Fire Scout System. MQ-8 systems will support missions on Littoral Combat Ship (LCS) and/or suitably-equipped air capable ships. Quantities of air vehicles are derived from LCS and/or suitably-equipped air capable ship deployment requirements for Surface Warfare and Mine Countermeasures mission sets.

The MQ-8 Radar capability is the initial effort as part of the Surface Warfare (SUW) Increment of the MQ-8C. A maritime Radar has been competitively selected for integration into the MQ-8C Fire Scout System. This system will provide the MQ-8 operators and the supported Littoral Combat Ship (LCS) crew enhanced situational awareness of the Recognized Maritime Picture (RMP) by providing multiple operational modes to include surface search, track, Inverse Synthetic Aperture Radar (ISAR) maritime target classification, and Synthetic Aperture Radar (SAR) target classification capabilities. The maritime Radar will be fully integrated with the Mission Control Systems (MCS) and ship's combat systems providing data in standardized format for ease of dissemination to other users.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 52.770 | 26.518 | 10.902 | - | 10.902 |
| Current President's Budget | 52.770 | 26.518 | 62.656 | - | 62.656 |
| Total Adjustments | 0.000 | 0.000 | 51.754 | - | 51.754 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 51.500 | - | 51.500 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.254 | - | 0.254 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305231N *I MQ-8 UAV* |

**Change Summary Explanation**

Technical: FYDP funding increase supports Radar development, MQ-8C and Radar test requirements, and MQ-8C Weapons development. Radar and weapons increases support requirements outlined in the MQ-8C Capabilities Production Document (CPD). Test increases support completion of test team transition from contractor to government, DT and OT events to meet IOC, and deployment dates. Future payload efforts will be considered when developing current efforts.

Schedule:
Updated Milestone C decision and other milestones to align to the restructured MQ-8 program.
Updated Radar capability contract awards, payloads efforts, and reviews to align to the restructured MQ-8 program.
Updated production and delivery schedules for the current production plan.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 0305231N / *MQ-8 UAV* | | | | Project (Number/Name)<br>2768 / *MQ-8 Fire Scout* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2768: *MQ-8 Fire Scout* | 411.245 | 52.770 | 26.518 | 62.656 | - | 62.656 | 19.952 | 26.533 | 28.775 | 22.213 | 88.512 | 739.174 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 253

**A. Mission Description and Budget Item Justification**

The FY18 increase supports Radar development, MQ-8C and Radar test requirements, and MQ-8C Weapons development. Radar and weapons increases support requirements outlined in the MQ-8C Capabilities Production Document (CPD). Test increases support completion of test team transition from contractor to government, DT and OT events to meet IOC, and deployment dates.

The MQ-8 Unmanned Air System is popularly known as "Fire Scout". The Department conducted a Title 10 Section 2433 (Nunn-McCurdy Breach) review on the MQ-8 program in 2014 due to a unit cost breach and certified a restructured program to Congress on 16 June 2014. The restructured program includes MQ-8B air vehicles procured under the original program of record (POR), MQ-8C air vehicles (Endurance Upgrade) procured under the Department of the Navy's Rapid Deployment Capability (RDC) procurement process, and additional MQ-8C air vehicles to be procured to complete the program Fleet requirements, and associated Mission Control Systems (MCS), Unmanned Aerial Vehicle Common Automatic Recovery Systems (UCARS) and support equipment. In addition to the air vehicles, Radar and Weapons capabilities were developed under the Navy's RDC authorities. All acquisition actions previously planned under the RDCs have transitioned into the restructured POR. Current FY16 analysis has determined that a total fleet requirement of 60 air vehicles (51 procurement and 9 RDT&EN / 30 MQ-8Bs and 30 MQ-8Cs) will satisfy current needs thus reducing the total number of MQ-8C production air vehicles to a quantity of 30, a decrement of 10 from previous budget submits.

The MQ-8B-based system achieved Milestone C (MS C) in May 2007. The Nunn-McCurdy certification process revoked the program's MS C approval. MS C for the restructured MQ-8 program is currently scheduled for FY 2017.

The MQ-8 System provides real-time and non-real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or reliance on limited joint theater or national assets. The baseline MQ-8 can accomplish missions including over-the-horizon tactical reconnaissance, classification, targeting and laser designation and battle damage assessment (including voice communications relay). Development efforts respond to emerging fleet requirements through integration and improvements to Common Operational Picture capabilities, avionics, payloads, range, endurance, and targeting.

The MQ-8 launches and recovers vertically, and can operate from suitably-equipped air capable ships, as well as confined area land bases. Interoperability is achieved through the use of the Tactical Control System (TCS) software in the MCS, also referred to as a Ground Control Station (GCS), and through the use of the Tactical Common Data Link (TCDL). The data from the MQ-8 is provided through standard DoD Command, Control, Communications, Computers and ISR (C4ISR) system architectures and protocols.

A deployed MQ-8 system includes air vehicle(s), payloads (i.e. electro-optical/infrared/laser designator-range finder, Automated Identification System, voice communications relay, Radar, Weapons, and other specialty payloads), MCS (with TCS and TCDL integrated for interoperability), a UCARS for automatic launch and

recovery, and associated spares and support equipment. The schedules for MCS and UCARS components are based on host ship requirements, while schedules for air vehicle components, support equipment, and training equipment are based on operational deployment plans. A limited number of land-based mission control systems supplement the shipboard systems to support shore-based operations, such as pre-deployment or acceptance functional check flights. These land-based mission control stations will also support depot-level maintenance/post-maintenance activities. The MQ-8C provides additional mission endurance and payload-weight-power, increased reliability, and improved maintainability to the MQ-8 Fire Scout System.

MQ-8 systems will support missions on Littoral Combat Ship (LCS) and/or suitably-equipped air capable ships. Quantities of air vehicles are derived from LCS and/or suitably-equipped air capable ship deployment requirements for Surface Warfare and Mine Countermeasures mission sets. FYDP funds support the completion of MQ-8C and Radar development, and studies on Weapons and future payloads. Future payload efforts will be considered when developing current efforts.

The MQ-8 Radar capability is the initial effort as part of the Surface Warfare (SUW) Increment of the MQ-8C. A maritime Radar will be competitively selected for integration into the MQ-8C Fire Scout System. This system will provide the MQ-8 operators and the supported LCS crew enhanced situational awareness of the Recognized Maritime Picture (RMP) by providing surface search, track, Inverse Synthetic Aperture Radar (ISAR) maritime target classification, and Synthetic Aperture Radar (SAR) target classification capabilities. The maritime Radar will be fully integrated with the MCS and ship's combat systems providing data in standardized format for ease of dissemination to other users.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Hardware and System Development | 43.832 | 11.275 | 31.375 | 0.000 | 31.375 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued MQ-8C hardware, software modifications, and other payload integration. Continued MQ-8 integration and testing on Littoral Combat Ship (LCS). Continued MQ-8C Endurance Upgrade and Radar development Continued MQ-8B FOT&E. | | | | | |
| ***FY 2017 Plans:***<br>Continue MQ-8C hardware, software modifications, and other payload integration. Continue MQ-8 integration and testing on LCS. Continue integration of the selected Radar with the MQ-8C Air Vehicle and Mission Control Systems (MCS). Complete qualification of the selected Radar for the MQ-8C operational environment. Continue System Integration Lab testing of the software build for the maritime Radar integration. Continue MQ-8B FOT&E. | | | | | |
| ***FY 2018 Base Plans:***<br>Continue MQ-8C hardware, software modifications, other payload integration, cyber vulnerability closure and safety capability improvements such a backup landing system and collision avoidance systems. Continue MQ-8 integration and testing on LCS. Continue integration of the selected Radar with the MQ-8C Air Vehicle and | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| MCS. Complete qualification of the selected Radar for the MQ-8C operational environment. Complete System Integration Lab testing of the software build for the maritime Radar integration. Continue MQ-8 FOT&E<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Development/Operational Testing | 3.793 | 7.436 | 19.616 | 0.000 | 19.616 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued Dynamic Interface testing of MQ-8C on both classes of Mission Control Systems (MCS). Completed MQ-8C Endurance Upgrade developmental testing. Continued IOT&E testing of MQ-8C on LCS. Continued other payload integration and testing. Continued MQ-8B FOT&E.<br>***FY 2017 Plans:***<br>Continue Dynamic Interface testing of MQ-8C on both classes of Littoral Combat Ship (LCS). Continue MQ-8C developmental testing of hardware and software modifications and planning for other payload integration. Continue Operational Test and Evaluation testing of MQ-8C on LCS. Start Developmental Testing of the maritime Radar on the MQ-8C Air Vehicle. Continue MQ-8B FOT&E.<br>***FY 2018 Base Plans:***<br>Complete Dynamic Interface testing of MQ-8C on both classes of Littoral Combat Ship (LCS). Continue MQ-8C developmental testing of hardware and software modifications and planning for the other payload integration. Complete Operational Test and Evaluation testing of MQ-8C on LCS. Continue developmental Testing of the maritime Radar on the MQ-8C Air Vehicle. Complete transition of the test team from contractor to government. Continue MQ-8 FOT&E.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Engineering and Technical Services | 5.145 | 7.807 | 11.665 | 0.000 | 11.665 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>Continued engineering, program technical management, and logistics support. Continued acquisition planning and execution to transition the MQ-8C, Radar, and Weapons capabilities. Continued Radar, Weapons, other | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| payloads, Littoral Combat Ship (LCS) capabilities payloads, and system studies and design. Continued MQ-8B FOT&E.<br>***FY 2017 Plans:***<br>Continue engineering, program technical management, logistics support of the MQ-8C. Continue acquisition planning and execution to transition the Radar, and Weapons capabilities. Continue Radar, Weapons, other payloads, LCS integration, and system studies and design. Continue MQ-8B FOT&E.<br>***FY 2018 Base Plans:***<br>Continue engineering, program technical management, logistics support of the MQ-8C. Continue acquisition planning and execution to transition the Radar, and Weapons capabilities. Continue Radar, Weapons, other payloads, LCS integration, and system studies and design. Continue MQ-8 FOT&E.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 52.770 | 26.518 | 62.656 | 0.000 | 62.656 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN, 044300: *MQ-8 UAV* | 158.680 | 72.435 | 49.472 | - | 49.472 | 67.463 | 30.260 | 24.174 | 46.863 | 56.055 | 1,305.923 |
| • APN, 060510: *MQ-8 UAV Spares* | 0.000 | 1.506 | 3.499 | - | 3.499 | 3.781 | 2.418 | 0.803 | 0.726 | 0.000 | 124.670 |
| • APN, 058800: *MQ-8 Series* | 16.304 | 19.003 | 32.361 | - | 32.361 | 19.081 | 18.020 | 29.916 | 30.927 | 73.230 | 247.509 |

**Remarks**

**D. Acquisition Strategy**

The Navy's acquisition strategy capitalizes on prior Rapid Deployment Capability efforts, while leveraging existing program investments. The acquisition strategy maintains commonality of MQ-8B and MQ-8C systems, payloads, avionics, software, and ancillary equipment where possible. The acquisition strategy supports the revised Capability Production Document. Initial Operational Capability (IOC) of an MQ-8B-based system was achieved in 2QFY14 while IOC of an MQ-8C-based system onboard Littoral Combat Ship (LCS) is anticipated in 4QFY18. The maritime Radar has been competitively selected. The integration effort will require sole source contracts to the current prime Original Equipment Manufacturers (OEMs) for the Tactical Control System and the MQ-8 Fire Scout air vehicle.

**E. Performance Metrics**

Successfully provide an MQ-8C air vehicle that supports operational deployments. Successfully provide a Radar capability for operational deployments. Successfully achieve Littoral Combat Ship integration.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development (MQ-8) | C/CPIF | Northrop Grumman Corp : San Diego, CA | 305.395 | 32.730 | Nov 2015 | 9.317 | Nov 2016 | 28.838 | Nov 2017 | - | | 28.838 | 75.821 | 452.101 | 452.101 |
| Primary Hardware Development (MQ-8) | C/CPIF | Raytheon Corp : Falls Church, VA | 18.986 | 5.265 | Nov 2015 | 1.958 | Nov 2016 | 2.537 | Nov 2017 | - | | 2.537 | 11.368 | 40.114 | 40.114 |
| Primary Hardware Development(RADAR OEM) | C/CPIF | Leonardo MW : Edinburgh, United Kingdom | 4.984 | 5.837 | Nov 2015 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 10.821 | 10.821 |
| | | **Subtotal** | 329.365 | 43.832 | | 11.275 | | 31.375 | | - | | 31.375 | 87.189 | 503.036 | 503.036 |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integrated Logistics Support | Various | Various : Various | 3.051 | 0.000 | | 0.000 | | 1.819 | Nov 2017 | - | | 1.819 | 5.374 | 10.244 | - |
| | | **Subtotal** | 3.051 | 0.000 | | 0.000 | | 1.819 | | - | | 1.819 | 5.374 | 10.244 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | NAWCAD : PAXRV, MD | 10.235 | 0.000 | Feb 2016 | 2.386 | Nov 2016 | 12.569 | Nov 2017 | - | | 12.569 | 27.017 | 52.207 | - |
| Operational Test & Evaluation/QRA | WR | NAWCWD : CHINALK, CA | 5.983 | 3.793 | Feb 2016 | 5.050 | Mar 2017 | 7.047 | Nov 2017 | - | | 7.047 | 20.819 | 42.692 | - |
| Prior Years T&E no longer funded in the FYDP | Various | Various : Various | 0.378 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.378 | - |
| | | **Subtotal** | 16.596 | 3.793 | | 7.436 | | 19.616 | | - | | 19.616 | 47.836 | 95.277 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305231N / *MQ-8 UAV* | Project (Number/Name)<br>2768 / *MQ-8 Fire Scout* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Engineering Support | WR | NAWCAD : PAXRV, MD | 44.872 | 3.665 | Nov 2015 | 4.695 | Nov 2016 | 7.116 | Nov 2017 | - | | 7.116 | 28.515 | 88.863 | - |
| Program Management Support | Various | Various : Various | 13.612 | 1.360 | Nov 2015 | 2.787 | Nov 2016 | 2.405 | Nov 2017 | - | | 2.405 | 12.636 | 32.800 | - |
| Travel | WR | NAVAIR : PAXRV, MD | 1.292 | 0.120 | Nov 2015 | 0.325 | Nov 2016 | 0.325 | Nov 2017 | - | | 0.325 | 2.804 | 4.866 | - |
| Prior years Mgmt Svcs no longer funded in the FYDP | Various | Various : Various | 2.457 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.457 | - |
| | | **Subtotal** | 62.233 | 5.145 | | 7.807 | | 9.846 | | - | | 9.846 | 43.955 | 128.986 | - |

**Remarks**

Travel contract type is TO.

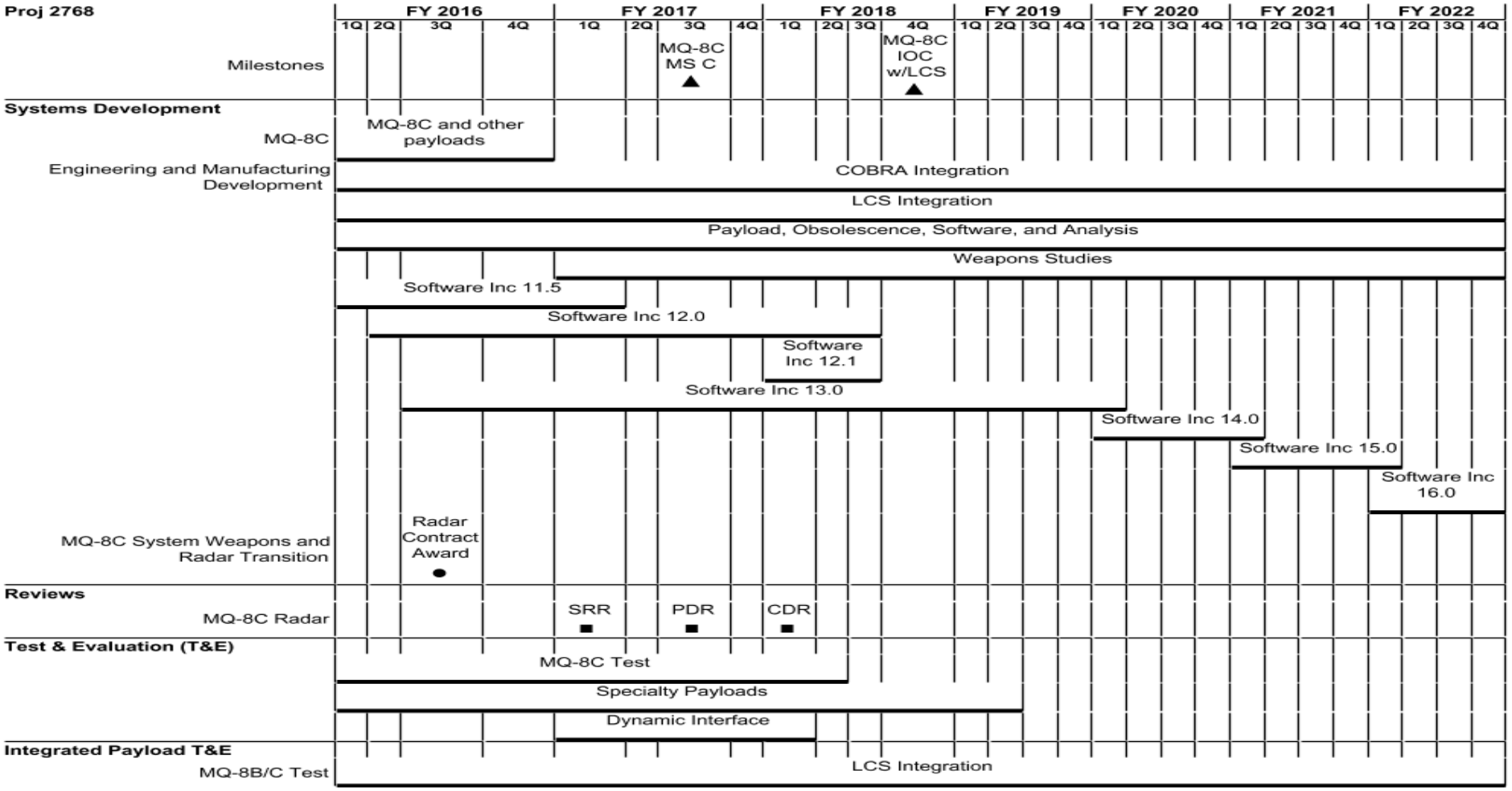
| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 411.245 | 52.770 | | 26.518 | | 62.656 | | - | | 62.656 | 184.354 | 737.543 | - |

**Remarks**

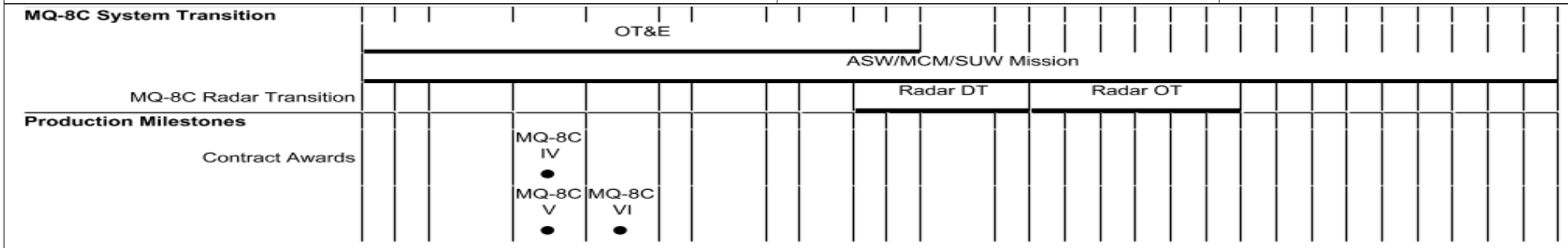
DT&E Team transitioning from contractor to government.

OT&E includes MQ-8C IOT&E.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |



| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |




*2018PB - 0305231N - 2768*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2768*** | | | | |
| Milestones: MQ-8 Initial Operational Capability (IOC) - MQ-8C Littoral Combat Ship (LCS) | 4 | 2018 | 4 | 2018 |
| Milestones: MQ-8C Milestone C Decision | 3 | 2017 | 3 | 2017 |
| Systems Development: MQ-8C: MQ-8C and other payloads | 1 | 2016 | 4 | 2016 |
| Systems Development: Engineering and Manufacturing Development: Coastal Battlefield Reconnaissance and Analysis Integration (COBRA), BLK 1/2/3 | 1 | 2016 | 4 | 2022 |
| Systems Development: Engineering and Manufacturing Development: Littoral Combat Ship (LCS) Integration | 1 | 2016 | 4 | 2022 |
| Systems Development: Engineering and Manufacturing Development: Payload, Obsolescence, Software, and Analysis | 1 | 2016 | 4 | 2022 |
| Systems Development: Engineering and Manufacturing Development: Weapons Studies | 1 | 2017 | 4 | 2022 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 11.5 | 1 | 2016 | 1 | 2017 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 12.0 | 2 | 2016 | 3 | 2018 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 12.1 | 1 | 2018 | 3 | 2018 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 13.0 | 3 | 2016 | 1 | 2020 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 14.0 | 1 | 2020 | 1 | 2021 |
| Systems Development: Engineering and Manufacturing Development: Software Increment 15.0 | 1 | 2021 | 1 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305231N / *MQ-8 UAV* | **Project (Number/Name)**<br>2768 / *MQ-8 Fire Scout* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Systems Development: Engineering and Manufacturing Development: Software Increment 16.0 | 1 | 2022 | 4 | 2022 |
| Systems Development: MQ-8C System Weapons and Radar Transition: Radar Contract Award | 3 | 2016 | 3 | 2016 |
| Reviews: MQ-8C Radar: System Requirements Review (SRR) | 1 | 2017 | 1 | 2017 |
| Reviews: MQ-8C Radar: Preliminary Design Review (PDR) | 3 | 2017 | 3 | 2017 |
| Reviews: MQ-8C Radar: Critical Design Review (CDR) | 1 | 2018 | 1 | 2018 |
| Test & Evaluation (T&E): MQ-8C Development Test | 1 | 2016 | 2 | 2018 |
| Test & Evaluation (T&E): Specialty Payloads | 1 | 2016 | 2 | 2019 |
| Test & Evaluation (T&E): MQ-8C Dynamic Interface (DI) Testing | 1 | 2017 | 1 | 2018 |
| Integrated Payload T&E: MQ-8B/C Test: Littoral Combat Ship (LCS) Integration | 1 | 2016 | 4 | 2022 |
| MQ-8C System Transition: Operational Test and Evaluation (OT&E) | 1 | 2016 | 3 | 2018 |
| MQ-8C System Transition: ASW/MCM/SUW Mission | 1 | 2016 | 4 | 2022 |
| MQ-8C System Transition: MQ-8C Radar Transition: Radar Developmental Test (DT) | 2 | 2018 | 1 | 2019 |
| MQ-8C System Transition: MQ-8C Radar Transition: Radar Operational Test (OT) | 2 | 2019 | 3 | 2020 |
| Production Milestones: Contract Awards: Air Vehicles MQ-8C IV | 4 | 2016 | 4 | 2016 |
| Production Milestones: Contract Awards: Air Vehicles MQ-8C V | 4 | 2016 | 4 | 2016 |
| Production Milestones: Contract Awards: Air Vehicles MQ-8C VI | 1 | 2017 | 1 | 2017 |

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305232M *I RQ-11 UAV* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 2.807 | 0.635 | 0.418 | 2.022 | - | 2.022 | 0.535 | 0.521 | 0.532 | 0.545 | Continuing | Continuing |
| 2292: *Unmanned Air Systems (Intel)* | 2.807 | 0.635 | 0.418 | 2.022 | - | 2.022 | 0.535 | 0.521 | 0.532 | 0.545 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The Small Unit Remote Scouting System (SURSS) - The SURSS program procures unmanned aircraft systems (UAS) to provide battalion/company/detachment level units with scalable airborne reconnaissance and surveillance to aid in detecting, identifying, engaging, or avoiding enemy units. Multiple systems, to include RQ-12 Wasp, RQ-11 Raven, RQ-20 Puma and various Nano/VTOL UAS's are required to meet various operational requirements delineated in the Operational Requirements Document. The SURSS program also conducts Field User Evaluations (FUEs) to support Universal Urgent Needs Statements (UUNS) that inform future USMC system procurement and ensure Marines have the most current technology available.

Development efforts for SURSS are ongoing in order to keep Group I-II UAS capability in line with emerging technologies and threats. SURSS is developing a Single Operator Man-Portable Ground Control System (SOMGCS) to improve portability and digital interoperability. Mobile ad-hoc network (MANET) communication relay, laser marker, and Signals Intelligence payloads integration are being developed to improve effectiveness and interoperability to better support the warfighter. Improvements such as solar technology, improved batteries, software upgrades, and alternative repair components are being explored to improve effectiveness, reliability, and reduce support costs.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.635 | 0.418 | 1.510 | - | 1.510 |
| Current President's Budget | 0.635 | 0.418 | 2.022 | - | 2.022 |
| Total Adjustments | 0.000 | 0.000 | 0.512 | - | 0.512 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 0.500 | - | 0.500 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.012 | - | 0.012 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305232M *I RQ-11 UAV* |

**Change Summary Explanation**

Increase in FY 2018 from FY 2017 of $1.6M is due to increased integration requirement for SOMGCS Software and MANET, as well as beginning integration of the Laser Marker. Operational assessments begin in FY18 for these items as well and equates to the increase in funding from FY17.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305232M / *RQ-11 UAV* | Project (Number/Name)<br>2292 / *Unmanned Air Systems (Intel)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2292: *Unmanned Air Systems (Intel)* | 2.807 | 0.635 | 0.418 | 2.022 | - | 2.022 | 0.535 | 0.521 | 0.532 | 0.545 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The Small Unit Remote Scouting System (SURSS) - The SURSS program procures unmanned aircraft systems (UAS) to provide battalion/company/detachment level units with scalable airborne reconnaissance and surveillance to aid in detecting, identifying, engaging, or avoiding enemy units. Multiple systems, to include RQ-12 Wasp, RQ-11 Raven, RQ-20 Puma and various Nano/VTOL UAS's are required to meet various operational requirements delineated in the Operational Requirements Document. The SURSS program also conducts Field User Evaluations (FUEs) to support Universal Urgent Needs Statements (UUNS) that inform future USMC system procurement and ensure Marines have the most current technology available.

RQ-12 Wasp (Block 0) - Wasp is a small, all environment UAS with a wingspan of 3.3 feet weight of 2.25 pounds and endurance of 60 minutes. The payload consists of a gimbaled turret with Electro Optical/Infrared (EO/IR) sensor. It allows maximum portability and provides near real time reconnaissance required by the platoon and rifle squad which reduces the Intelligence, Surveillance, and Reconnaissance (ISR) request-to-response timeframe and eliminates delays or denials for coverage due to an imbalance of unmanned air systems to requests. Wasp is used for remote reconnaissance and surveillance, force protection, convoy security, target acquisition, and battle damage assessment. A Wasp system consists of two air vehicles, two GCSs, and one reconnaissance, surveillance, and target acquisition (RSTA) kit.

RQ-11 Raven (Block 1) - Raven is a small UAS with a wingspan of 4.6 feet, weight of 5 pounds and endurance of 90 minutes. The Raven employs a gimbaled EO/IR sensor. The Raven can be carried by personnel on foot and provides the company level unit an organic near real time ISR capability that facilitates rapid battlefield decision making. A Raven system consists of three air vehicles, two GCS, and one RSTA kit.

RQ-20 Puma (Block 2) - Puma is an all environment UAS with a wingspan of 9.2 feet, weight of 13 pounds and endurance of 2.5 hours. The PUMA has demonstrated ranges up to 28 kilometers. The standard payload consists of a gimbaled turret with an EO/IR sensor. A Signals Intelligence payload is also available. The PUMA provides an organic, persistent ISR capability to battalion level units. Additionally, it has been used extensively by Route Clearance Platoons (RCP) and Combat Logistics Patrols (CLP) to enhance force protection and detect Improvised Explosive Devices (IEDs). A Puma system consists of two air vehicles, two GCSs, and one RSTA kit.

Long Endurance Small UAS - LE SUAS is an organic Group 1-2 UAS operated and maintained by a ground or similar tactical unit. It includes Vertical Take Off and Landing (VTOL) kit capability, quiet electric motor/hybrid fuel cell technology, high definition electro optic/infrared/laser (marker or designator) payload, and long range antenna kit. The air vehicle travels at an altitude of about 500-1000 feet about ground level at an approximate speed of 35 knots with an endurance of greater than eight hours with a fuel cell, and four hours with battery. It can be launched with an optional VTOL kit or with a launcher system. Mission sets include real-time full motion video for airborne intelligence, surveillance, reconnaissance (AISR), force protection, targeting, pattern of life observation, high value target tracking, control of indirect fires, full motion video to support target analysis, target package development, counter small UAS, spectrum operations (e.g. SIGINT/Cyber/EW) and communications relay/

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305232M / *RQ-11 UAV* | **Project (Number/Name)**<br>2292 / *Unmanned Air Systems (Intel)* |

extension. A system consists of three air vehicles, one ground control station, and associated equipment. Additionally, this system and similar organic small UAS require system modifications and integration to adapt for Field User Evaluations (FUE).

Increase in FY 2018 from FY 2017 of $1.604M is due to increased integration and test requirements.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development and Support | 0.635 | 0.418 | 1.106 | 0.000 | 1.106 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The $0.688M increase from FY17 to FY18 is due to laser marker development occurring in FY18 and increased development requirements for continuing efforts.<br><br>***FY 2016 Accomplishments:***<br>-Continued Single Operator Man-Portable Ground Control Station (SOMGCS) development and integration with Killswitch, common software and hardware solution.<br>-Completed assessment of rapid charging capabilities.<br>-Initiated development and integration of Mobile Ad hoc Networks communication relay (MANET).<br>-Initiated development and integration of electronic warfare capability (SIGINT) kit.<br>-Initiated initial assessment of laser marker.<br><br>***FY 2017 Plans:***<br>-Continue SOMGCS development and transition to production.<br>-Continue development and integration of Mobile Ad hoc Networks communication relay (MANET).<br>-Continue integration electronic warfare capability (SIGINT) kit.<br>-Initiate and complete operational assessment of SOMGCS.<br><br>***FY 2018 Base Plans:***<br>-Complete integration of electronic warfare capability (SIGINT) kit, laser marker, and Mobile Ad hoc Networks communication relay (MANET).<br>-Initiate software development for SOMGCS to improve digital interoperability<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation (Operational Assessment) | 0.000 | 0.000 | 0.916 | 0.000 | 0.916 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The $0.916M increase in funding from FY17 to FY18 is due test and evaluation efforts starting that did not occur in FY17. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305232M / *RQ-11 UAV* | **Project (Number/Name)**<br>2292 / *Unmanned Air Systems (Intel)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>-Initiate operational assessment of MANET, and Laser Marker.<br>-Initiate assessment of low cost, commercial available Unmanned Aerial Systems to inform future procurements, and determine potential adversary capabilities.<br>-Change in funding from FY17 to FY18 is due test and evaluation efforts starting that did not occur in FY17.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.635 | 0.418 | 2.022 | 0.000 | 2.022 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4757: *RQ-11 UAV* | 13.430 | 19.293 | 10.154 | - | 10.154 | 2.757 | 2.868 | 2.977 | 3.002 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The program office is pursuing a rapid acquisition approach to quickly field new technology and capabilities to the warfighter. The strategy is to use evolutionary acquisition with incremental developments to meet the final desired Small Unit Remote Scouting System (SURSS) requirements (Joint USMC/USA/SOCOM capabilities). The next increment will involve an evolution to a Group 1-2 (Family of System) individually capable of executing requirements for long, medium and short range missions in fulfillment of the SURSS requirement. A comprehensive review of service small UAS needs is being conducted to update current requirements documents.

**E. Performance Metrics**

Successful operational test of MANET, SIGINT and Laser Marker payloads.
Successful operational test of SOMGCS.
Fielding of the SOMGCS, MANET, SIGINT and Laser Marker payloads in accordance with planned schedule.
Fielding of remaining RQ-20 PUMA systems in accordance with planned schedule.
Demonstrated improvements in Digital Interoperability.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305233N / *RQ-7 UAV* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 22.540 | 0.688 | 0.716 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.944 |
| 9C84: *MCTUAS* | 22.540 | 0.688 | 0.716 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.944 |

**A. Mission Description and Budget Item Justification**

This Marine Corps Tactical Unmanned Aircraft System project supports the fielded RQ-7B Shadow Unmanned Aircraft System (UAS) by conducting research, development, test and evaluation for improvement of the RQ-7 UAS capabilities in Reconnaissance, Surveillance and Target Acquisition, Intelligence, Battle Damage Assessment, Laser Designation and Force Protection. The RQ-7B Shadow UAS provides critical battlefield intelligence and targeting information in the rapid cycle time required for success at the tactical level.

RQ-7B Shadow UAS are acquired through the United States Army (US Army) UAS Program Office to fulfill United States Marine Corps (USMC) UAS requirements. In order to optimize interoperability, maintainability, and capability with minimal cost, the USMC and US Army plan to develop additional capabilities for the common RQ-7 system to include the fuselage, flight and mission electrical and electronic systems, propulsion system, communications system, expeditionary footprint, and capability payloads. These funds represent the USMC share of the combined joint development cost through Program Management Office UAS and the RQ-7 USMC specific development efforts of the NAVAIR 5.1 UAV Test Directorate.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full-rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.688 | 0.716 | 0.956 | - | 0.956 |
| Current President's Budget | 0.688 | 0.716 | 0.000 | - | 0.000 |
| Total Adjustments | 0.000 | 0.000 | -0.956 | - | -0.956 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.956 | - | -0.956 |

**Change Summary Explanation**

Schedule: Not applicable.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305233N *I RQ-7 UAV* |

Technical: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305233N / *RQ-7 UAV* | Project (Number/Name)<br>9C84 / *MCTUAS* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9C84: *MCTUAS* | 22.540 | 0.688 | 0.716 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 23.944 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This Marine Corps Tactical Unmanned Aircraft System project supports the fielded RQ-7B Shadow Unmanned Aircraft System (UAS) by conducting research, development, test and evaluation for improvement of the RQ-7 UAS capabilities in Reconnaissance, Surveillance and Target Acquisition, Intelligence, Battle Damage Assessment, Laser Designation and Force Protection. The RQ-7B Shadow UAS provides critical battlefield intelligence and targeting information in the rapid cycle time required for success at the tactical level.

RQ-7B Shadow UAS are acquired through the United States Army (US Army) UAS Program Office to fulfill United States Marine Corps (USMC) UAS requirements. In order to optimize interoperability, maintainability, and capability with minimal cost, the USMC and US Army plan to develop additional capabilities for the common RQ-7 system to include the fuselage, flight and mission electrical and electronic systems, propulsion system, communications system, expeditionary footprint, and capability payloads. These funds represent the USMC share of the combined joint development cost through Program Management Office UAS and the RQ-7 USMC specific development efforts of the NAVAIR 5.1 UAV Test Directorate.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** MCTUAS Development Support | 0.688 | 0.716 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Joint development efforts with US Army RQ-7 Shadow Program, for common RQ-7 block upgrades, United States Marine Corps specific development efforts at the joint and Navy unique levels required for continued improvement and interoperability. | | | | | |
| ***FY 2016 Accomplishments:***<br>Development of Phase II Global Positioning System Threat Operations initiative in support of Information Assurance and communications systems improvement efforts for Intelligence Surveillance Reconnaissance Systems. | | | | | |
| ***FY 2017 Plans:***<br>Funding continues development for ongoing initiatives and will initiate development efforts for improvements to Intelligence Surveillance Reconnaissance systems, external payloads, communications systems, digital interoperability initiative, propulsion systems, and expeditionary footprint. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305233N / *RQ-7 UAV* | **Project (Number/Name)**<br>9C84 / *MCTUAS* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.688 | 0.716 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0589: *RQ-7 UAV* | 3.773 | 3.534 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 100.843 |

**Remarks**

**D. Acquisition Strategy**

Program executes all product development and test/evaluation requirements through a development services contract with Textron Systems Unmanned System (formerly Aircraft Armament Incorporated) through US Army Program Office UAS. This contract incorporates various performing activities and locations based on the US Army Program Office UAS contracts.

**E. Performance Metrics**

Attainment of targeted development effort upgrades improving operational capability of the RQ-7 UAS USMC Tactical UAS.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305234N *I (U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 69.322 | 4.647 | 5.071 | 4.835 | - | 4.835 | 5.551 | 5.293 | 5.403 | 5.509 | Continuing | Continuing |
| 3192: *RQ-21 BLACKJACK* | 69.322 | 4.647 | 5.071 | 4.835 | - | 4.835 | 5.551 | 5.293 | 5.403 | 5.509 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The RQ-21A BLACKJACK (formerly known as The Small Tactical Unmanned Aircraft System (STUAS)) is a combined United States Navy (USN) and United States Marine Corps (USMC) program that provides persistent maritime and land-based tactical Intelligence, Surveillance, and Reconnaissance/Target Acquisition support for tactical level maneuver decisions and unit level force defense/force protection for Naval amphibious assault ships (multi-ship classes) and Navy and Marine land forces. This system will support Naval Missions such as building the Recognized Maritime Picture, Maritime Security Operations, Maritime Interdiction Operations, and provide support for Naval Units operating from sea/shore in Overseas Contingency Operations. This submission is the USNs portion of the program and has been coordinated with the USMC budget submission PE 0305239M (RQ-21A).

The RQ-21A BLACKJACK system will continue to evolve and upgrade capabilities to satisfy capabilities shortfalls, new requirements, and reliability, maintainability and safety issues. Upgraded capabilities may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Laser Designator, Frequency Agile Communications Relay, Digital Common Data Link, and cyclic refresh of the Electro-Optical/Infrared camera. RQ-21A BLACKJACK will also continue to expand its shipboard capability across new ship classes.

This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full-rate production and anticipate funding in the current or subsequent fiscal year.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.647 | 5.071 | 5.218 | - | 5.218 |
| Current President's Budget | 4.647 | 5.071 | 4.835 | - | 4.835 |
| Total Adjustments | 0.000 | 0.000 | -0.383 | - | -0.383 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.364 | - | -0.364 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.019 | - | -0.019 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305234N *I (U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* |

**Change Summary Explanation**

The FY 2018 funding request was reduced by $0.364M to account for the availability of prior year execution balances.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* | Project (Number/Name)<br>3192 / *RQ-21 BLACKJACK* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3192: *RQ-21 BLACKJACK* | 69.322 | 4.647 | 5.071 | 4.835 | - | 4.835 | 5.551 | 5.293 | 5.403 | 5.509 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The RQ-21A BLACKJACK (formerly known as The Small Tactical Unmanned Aircraft System (STUAS)) is a combined United States Navy (USN) and United States Marine Corps (USMC) program that provides persistent maritime and land-based tactical Intelligence, Surveillance, and Reconnaissance/Target Acquisition support for tactical level maneuver decisions and unit level force defense/force protection for Naval amphibious assault ships (multi-ship classes) and Navy and Marine land forces. This system will support Naval Missions such as building the Recognized Maritime Picture, Maritime Security Operations, Maritime Interdiction Operations, and provide support for Naval Units operating from sea/shore in Overseas Contingency Operations. This submission is the USNs portion of the program and has been coordinated with the USMC budget submission PE 0305239M (RQ-21A).

The RQ-21A BLACKJACK system will continue to evolve and upgrade capabilities to satisfy capabilities shortfalls, new requirements, and reliability, maintainability and safety issues. Upgraded capabilities may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Laser Designator, Frequency Agile Communications Relay, Digital Common Data Link, and cyclic refresh of the Electro-Optical/Infrared camera. RQ-21A BLACKJACK will also continue to expand its shipboard capability across new ship classes.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Upgrade Efforts | 1.961 | 1.833 | 1.523 | 0.000 | 1.523 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Provide Upgrade Efforts | | | | | |
| ***FY 2016 Accomplishments:***<br>RQ-21A Blackjack established a Corrective Action Program to continue the correction of deficiencies based on the final FY15 IOT&E Report, and the deficiencies identified during continuing developmental testing. The heavy fuel engine integration executed its first technical review. As well as, the cyclic refresh of the Electro-Optic/ Infrared camera upgrade work has begun and increased functionality of the communications relay package was demonstrated. Additionally, turret upgrade was initiated. | | | | | |
| ***FY 2017 Plans:***<br>RQ-21A Blackjack will continue correction of deficiencies for the IOT&E Report. The program will continue software engineering and development for block software updates. The program will complete heavy fuel engine | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* | **Project (Number/Name)**<br>3192 / *RQ-21 BLACKJACK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| development. Continue other upgrades which includes the cyclic refresh of the Electro-Optical/Infrared camera, associated turret system, communications relay package, and automated identification system.<br>***FY 2018 Base Plans:***<br>RQ-21A Blackjack Corrective Action Program will continue the correction of deficiencies from the IOT&E Report. The program will continue software engineering and development for block software updates. The program will continue to assess improvements to the fuel tank, maximum gross takeoff weight, recovery system, avionics module, and other components. Initiate assessment of block upgrade plan for the RQ-21A system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Engineering and Technical Services<br>***Articles:***<br>***Description:*** Provides for the Government Engineering Technical Support, Logistics Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support, Program related travel in support of the upgrade/payload efforts.<br>***FY 2016 Accomplishments:***<br>Provide support for the Government Engineering Technical Support, Logistics Support, Test and Evaluation, Other Government Support, Contract Support Services, Program Management Support, and program related travel in support of correction of deficiencies and upgrade efforts.<br>***FY 2017 Plans:***<br>Provide support for Government Engineering Technical Support, Logistics Support, Test and Evaluation, other Government support, Contractor Services support, Program Management Support, and program related travel in support of upgrades and correction of deficiencies. FY17 includes additional funding for Government Engineering technical support to perform and evaluate correction of deficiencies completed by the Government and Prime contractor based on the Initial Operational Test and Evaluation report released in 3QFY15.<br>***FY 2018 Base Plans:***<br>Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of correction of deficiencies and upgrade efforts<br>***FY 2018 OCO Plans:*** | 2.686<br>- | 3.238<br>- | 3.312<br>- | 0.000<br>- | 3.312<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* | **Project (Number/Name)**<br>3192 / *RQ-21 BLACKJACK* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.647 | 5.071 | 4.835 | 0.000 | 4.835 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0444: *STUASLO* | 57.298 | 70.000 | 0.880 | 3.900 | 4.780 | 1.070 | 0.000 | 0.000 | 0.000 | 0.000 | 206.348 |
| • RDTEN/0305239M: *(U)RQ-21A* | 6.251 | 9.497 | 8.899 | - | 8.899 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |
| • PMC/4737: *STUAS/RQ-21A* | 77.916 | 89.177 | 77.841 | 8.400 | 86.241 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 402.638 |
| • PMC/7000: *Spares and Repair Parts* | 4.070 | 5.812 | 11.027 | - | 11.027 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 37.401 |

**Remarks**

**D. Acquisition Strategy**

The program office has utilized a competitive acquisition approach for award of the Engineering and Manufacturing Development effort to field a capability that meets threshold requirements. Low Rate Initial Production (LRIP) test article was utilized to successfully complete Initial Operational Test and Evaluation (IOT&E). LRIP continues through FY16 to demonstrate production line maturity. Future payload upgrades and development shall be competitively sourced or procured via Government Laboratories with Insitu, the prime contractor, performing integration efforts as required.

**E. Performance Metrics**

Attainment of Full Rate Production, correction of deficiencies from the IOT&E Report, and attainment of United States Marine Corps and United States Navy Full Operational Capability in accordance with the approved schedule.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305239M *I (U)RQ-21A* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 66.029 | 6.251 | 9.497 | 8.899 | - | 8.899 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |
| 2298: *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* | 66.029 | 6.251 | 9.497 | 8.899 | - | 8.899 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 90.676 |
| 3192: *RQ-21 BLACKJACK* | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the war fighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN) RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission under PE 0305234N RQ-21A BLACKJACK.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 6.251 | 9.497 | 9.295 | - | 9.295 |
| Current President's Budget | 6.251 | 9.497 | 8.899 | - | 8.899 |
| Total Adjustments | 0.000 | 0.000 | -0.396 | - | -0.396 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.464 | - | -0.464 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.068 | - | 0.068 |

**Change Summary Explanation**

The FY 2018 funding request was reduced by $0.464M to account for the availability of prior year execution balances.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305239M / *(U)RQ-21A* | Project (Number/Name)<br>2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2298: *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* | 66.029 | 6.251 | 9.497 | 8.899 | - | 8.899 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 90.676 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

In FY19 this effort will move to PE 0305239M PU 3192 (RQ-21 Blackjack).

**A. Mission Description and Budget Item Justification**

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the Warfighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN) RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission PE 0305234N RQ-21A BLACKJACK.

The RQ-21A system will continue to evolve addressing capability shortfalls, new requirements, obsolescence equipment, reliability, maintainability, and safety issues. Additional capabilities and/or system upgrades may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Short Wave Infrared, Laser Designator, Frequency Agile Communications Relay, Digital Common Data link, and cyclic refresh of the Electro-optical/Infrared (EO/IR) camera.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 5.332 | 8.514 | 7.763 | 0.000 | 7.763 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continued correction of deficiencies from IOT&E, including ALTICAM (product name) turret upgrade.<br>-Continued software engineering and development for software block updates.<br>-Continued advanced heavy fuel engine development.<br>-Initiated cyclic technology refresh for EO/IR camera.<br>-Initiated product improvement program to assess and address improvements to the fuel tank, maximum gross takeoff weight, recovery system, avionics module, and other components. | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305239M / *(U)RQ-21A* | **Project (Number/Name)**<br>2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue correction of deficiencies from IOT&E.<br>-Continue software engineering and development for software block updates.<br>-Continue product improvement program to assess and address improvements to the fuel tank, maximum gross takeoff weight, recovery system, avionics module, and other components.<br>-Initiate Short Wave Infrared and Laser Designator Development.<br>-Complete advanced heavy fuel engine development.<br>-Complete cyclic technology refresh for EO/IR camera and associated ECP.<br>***FY 2018 Base Plans:***<br>-Continue correction of deficiencies from IOT&E.<br>-Continue software engineering and development for software block updates.<br>-Continue product improve program to assess and address improvements to the fuel tank, maximum gross takeoff weight, recovery system, avionics module, and other components.<br>-Initiate assessment of block upgrade plan for the RQ-21 system.<br>-Complete Short Wave Infrared and Laser Designator Development and associated ECP.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support | 0.628 | 0.628 | 0.629 | 0.000 | 0.629 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support efforts, and program related travel via NAWCAD Pax River in support of upgrades and technology refresh.<br>***FY 2017 Plans:***<br>-Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support efforts, and program related travel via NAWCAD Pax River in support of upgrades and technology refresh.<br>***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305239M / *(U)RQ-21A* | **Project (Number/Name)**<br>2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| -Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support efforts, and program related travel via NAWCAD Pax River in support of upgrades and technology refresh.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation | 0.291 | 0.355 | 0.507 | 0.000 | 0.507 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>-Initiate follow-on test and evaluation for Software build 7.5.2<br>***FY 2017 Plans:***<br>-Initiate follow-on test and evaluation for cyclic turret refresh.<br>-Initiate follow-on test and evaluation for recovery system upgrades.<br>***FY 2018 Base Plans:***<br>-Initiate follow-on test and evaluation for Short Wave Infrared (SWIR).<br>-Initiate follow-on test and evaluation for Laser Designator (LD).<br>-Initiate follow-on test and evaluation for Advanced Engine.<br>-Initiate follow-on test and evaluation for software build 7.X.X.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 6.251 | 9.497 | 8.899 | 0.000 | 8.899 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDTEN/0305234N: *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)* | 4.647 | 5.071 | 4.835 | - | 4.835 | 5.551 | 5.293 | 5.403 | 5.509 | Continuing | Continuing |
| • PMC/4737: *RQ-21 UAS* | 77.916 | 89.177 | 77.841 | 8.400 | 86.241 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 402.638 |
| • PMC/7000: *Spares and Repair Parts* | 4.070 | 5.812 | 11.027 | - | 11.027 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 37.400 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305239M / *(U)RQ-21A* | **Project (Number/Name)**<br>2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)* |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0444: *STUASLO* | 57.298 | 70.000 | 0.880 | 3.900 | 4.780 | 1.070 | 0.000 | 0.000 | 0.000 | 0.000 | 206.348 |

**Remarks**

**D. Acquisition Strategy**

The program office utilized a competitive acquisition approach to award the Engineering and Manufacturing Development effort to field a capability that meets threshold requirements. The Low Rate Initial Production (LRIP) test article was utilized to successfully complete Initial Operational Test and Evaluation. LRIP production continues through FY16 to demonstrate production line maturity. Marine Corps Initial Operational Capability was achieved in 2Q FY16 with entry into full rate production decision occurring in 4Q FY16. Future payload upgrades and development shall be competitively sourced or procured via Government Laboratories with Insitu, the prime contractor, performing integration efforts as required.

**E. Performance Metrics**

Attainment of Full Rate Production (FRP), correction of Deficiencies from the IOT&E Report, and attainment of USMC Initial Operational Capability (IOC) and Full Operational Capability (FOC) in accordance with the approved schedule.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305239M / *(U)RQ-21A* | Project (Number/Name)<br>3192 / *RQ-21 BLACKJACK* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3192: *RQ-21 BLACKJACK* | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 6.000 | 6.000 | 6.000 | 6.000 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the Warfighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN) RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission PE 0305234N RQ-21A BLACKJACK.

The RQ-21A system will continue to evolve addressing capability shortfalls, new requirements, obsolescence equipment, reliability, maintainability, and safety issues. Additional capabilities and/or system upgrades may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Short Wave Infrared, Laser Designator, Frequency Agile Communications Relay, Digital Common Data link, and cyclic refresh of the Electro-optical/Infrared (EO/IR) camera.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0305241N *I (U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 0.000 | 39.645 | 77.965 | 99.020 | - | 99.020 | 94.351 | 61.542 | 52.532 | 53.570 | Continuing | Continuing |
| 3329: *Multi Intelligence Sensor Development* | 0.000 | 31.577 | 39.795 | 31.162 | - | 31.162 | 31.707 | 28.169 | 28.792 | 29.359 | Continuing | Continuing |
| 3383: *P-8 Quick Reaction Capability (QRC)* | 0.000 | 8.068 | 38.170 | 67.858 | - | 67.858 | 62.644 | 33.373 | 23.740 | 24.211 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 39.645 | 77.965 | 99.593 | - | 99.593 |
| Current President's Budget | 39.645 | 77.965 | 99.020 | - | 99.020 |
| Total Adjustments | 0.000 | 0.000 | -0.573 | - | -0.573 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.573 | - | -0.573 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305241N / *(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT* | Project (Number/Name)<br>3329 / *Multi Intelligence Sensor Development* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3329: *Multi Intelligence Sensor Development* | 0.000 | 31.577 | 39.795 | 31.162 | - | 31.162 | 31.707 | 28.169 | 28.792 | 29.359 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305241N / *(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT* | Project (Number/Name)<br>3383 / *P-8 Quick Reaction Capability (QRC)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3383: *P-8 Quick Reaction Capability (QRC)* | 0.000 | 8.068 | 38.170 | 67.858 | - | 67.858 | 62.644 | 33.373 | 23.740 | 24.211 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305242M *I (U)Unmanned Aerial Systems (UAS) Payloads* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 9.246 | 11.181 | 18.578 | - | 18.578 | 10.029 | 8.187 | 4.733 | 4.026 | Continuing | Continuing |
| 5501: *Signals Intelligence (SIGINT)* | 0.000 | 3.564 | 6.062 | 5.618 | - | 5.618 | 3.917 | 2.792 | 2.858 | 2.917 | Continuing | Continuing |
| 5502: *Synthetic Aperture Radar/ Motion Target Indicator (SAR/ MTI)* | 0.000 | 5.682 | 5.119 | 5.860 | - | 5.860 | 3.193 | 1.067 | 1.087 | 1.109 | Continuing | Continuing |
| 5504: *Wide Area Persistent Surveillance (TNWAS)* | 0.000 | 0.000 | 0.000 | 7.100 | - | 7.100 | 2.919 | 4.328 | 0.788 | 0.000 | 0.000 | 15.135 |

**A. Mission Description and Budget Item Justification**

The Unmanned Aerial Systems (UAS) Payloads integration program will alleviate Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) capability gaps caused by rapidly changing missions, threats and technologies. It will provide responsive capability to integrate and support rapid fielding of ISR payloads for all UAS within the Marine Corps. Sensor payloads will increase the effectiveness and versatility of the Marine Corps UAS currently planned to have Electro-Optic(EO) / Infrared (IR) collection, communications relay, and automatic identification capabilities. Upgrades include, but are not limited to, Signals Intelligence (SIGINT)/ Electronic Warfare Support (ES), Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI), Wide Area and Hyperspectral Imagery collection.

These payloads provide the Marine Expeditionary Unit (MEU) organic capabilities that facilitate the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

The payload development process will follow a Hybrid Acquisition Model of Incremental/Spiral approach while leveraging work conducted by various government laboratories such as the Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA), Air Force Research Lab (AFRL), Joint Improvised Threat Defeat Agency (JIDA), the National Security Agency (NSA), and the National Geospatial Agency (NGA). All payloads will follow similar acquisition paths but on independent time schedules. These acquisition paths will be defined by three (3) phases, each marked by a decision gate. Phase I establishes the preliminary integration design concept and conduct of technology demonstration with validation of a Technology Readiness Level (TRL) 5/6 as the decision gate for Phase II. Phase II establishes full payload-to-Unmanned Aircraft System (UAS) integration during which time all necessary program management, engineering, fabrication, test, and evaluations activities are conducted to achieve Test Article Fabrication, System Test and Evaluation, Integrated Logistics Support (ILS) and Training Concept development, and Data Management and Documentation. Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy and achievement of TRL 7 or higher constitute the decision gate for Phase III. Phase III is program of record transition which supports a production decision based on the exit criteria from Phase II.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | R-1 Program Element (Number/Name)<br>PE 0305242M *I (U)Unmanned Aerial Systems (UAS) Payloads* | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 9.246 | 11.181 | 11.412 | - | 11.412 |
| Current President's Budget | 9.246 | 11.181 | 18.578 | - | 18.578 |
| Total Adjustments | 0.000 | 0.000 | 7.166 | - | 7.166 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 7.092 | - | 7.092 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.074 | - | 0.074 |

**Change Summary Explanation**

The funding increase of $7.4M from FY17 to FY18 reflects the development of a Wide Area Persistent Surveillance (WAS) payload and increase in SAR/MTI and WAS Product Development. The $7.1M reflected in FY18 for Proj 5504 Wide Area Persistent Surveillance is to ensure development efforts are completed within schedule to be able to begin procuring in FY21 in order to address the capability gap.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | Project (Number/Name)<br>5501 / *Signals Intelligence (SIGINT)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5501: *Signals Intelligence (SIGINT)* | 0.000 | 3.564 | 6.062 | 5.618 | - | 5.618 | 3.917 | 2.792 | 2.858 | 2.917 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The UAS Payloads program will develop and integrate a Signals Intelligence (SIGINT)/ Electronic Warfare Support (ES) payloads for Marine Corps small tactical UASs. SIGINT/ES payloads will fill current capability gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and is required as part of the Marine Corps mission to locate and target adversary Signals of Interest (SOI). The SIGINT/ES payload will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule. The payload currently under development is Spectral Bat. Future SIGINT payloads include the Tactical EO/IR SIGINT for integrated Targeting (TEISIT).

Test articles required in order to properly conduct testing requirements in order to field products on schedule to the fleet.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 2.851 | 5.594 | 5.139 | 0.000 | 5.139 |
| ***Articles:*** | 2 | 5 | - | - | - |
| ***Description:*** Decrease from FY 2017 to FY 2018 of $0.455M is due to decrease in requirements for system engineering. | | | | | |
| ***FY 2016 Accomplishments:***<br>- Completed Spectral Bat payload component development.<br>- Initiated Spectral Bat V4 development.<br>- Completed Spectral Bat engineering and experimental tests in preparation for FY17 testing.<br>- Completed construction of Spectral Bat V3 payload.<br>- Initiated construction of a prototype Spectral Bat V4 payload that can receive and process a minimum of four signals of interest (SOI).<br>- Initiated a Field User Evaluation of the Spectral Bat V3 payload. | | | | | |
| ***FY 2017 Plans:***<br>- Complete Spectral Bat V4 payload development.<br>- Complete construction of a prototype Spectral Bat system that can receive and process a minimum of four signals of interest (SOI). | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5501 / *Signals Intelligence (SIGINT)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Complete Spectral Bat V4 developmental tests.<br>***FY 2018 Base Plans:***<br>- Initiate development of a Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Initiated development of Spectral Bat payload software to include frequency agile airborne receiver software.<br>***FY 2017 Plans:***<br>- Complete development of Spectral Bat payload software to include frequency agile airborne receiver software.<br>***FY 2018 Base Plans:***<br>- Initiate development of TEISIT payload software.<br>***FY 2018 OCO Plans:***<br>N/A | 0.619<br>- | 0.375<br>- | 0.384<br>- | 0.000<br>- | 0.384<br>- |
| ***Title:*** Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Completed refinement and documentation of acquisition strategy.<br>- Initiated engineering required for flight clearances.<br>- Initiated development of an integrated master schedule.<br>- Initiated information assurance certification and accreditation.<br>***FY 2017 Plans:***<br>- Complete required engineering for flight clearances<br>- Initiate Integrated Logistics Support (ILS), Training Concept development and Data Management/ Documentation.<br>- Complete development of an integrated master schedule.<br>***FY 2018 Base Plans:*** | 0.094<br>- | 0.093<br>- | 0.095<br>- | 0.000<br>- | 0.095<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5501 / *Signals Intelligence (SIGINT)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Complete Integrated Logistics Support (ILS), Training Concept development and Data Management/ Documentation<br>- Complete information assurance certification and accreditation<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 3.564 | 6.062 | 5.618 | 0.000 | 5.618 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4787: *UAS Payloads* | 0.000 | 2.971 | 14.193 | - | 14.193 | 4.140 | 0.037 | 2.247 | 3.031 | 0.000 | 26.619 |

**Remarks**

**D. Acquisition Strategy**

The UAS Payload program utilizes a Hybrid Acquisition Model of Incremental/Spiral approach that leverages upon work conducted by various government laboratories in order to field capability that meets threshold requirements, facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

**E. Performance Metrics**

Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy and achievement of a TRL 7 or higher for Program of Record transition. Successful development of SIGINT payloads, integration into Marine Corps small tactical UAS, and completion of testing.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | Project (Number/Name)<br>5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5502: *Synthetic Aperture Radar/ Motion Target Indicator (SAR/ MTI)* | 0.000 | 5.682 | 5.119 | 5.860 | - | 5.860 | 3.193 | 1.067 | 1.087 | 1.109 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

NOTE: Increase in FY 2018 from FY 2017 of $0.705M is due to increased requirements in system product development systems engineering.

**A. Mission Description and Budget Item Justification**

The UAS Payloads program will develop and integrate Synthetic Aperture Radar (SAR) with Moving Target Indicator (MTI) for Marine Corps small tactical UASs. This capability fills current capability gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and will allow Marine Corps ISR assets to locate and track ground targets that cannot effectively be located or tracked with the current ground based or EO/IR airborne sensor technology.

The ability to locate and track moving ground targets from small tactical UAS is an essential capability that facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

SAR/MTI payloads will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule.

Test articles required in order to properly conduct testing requirements in order to field products on schedule to the fleet.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 5.399 | 4.133 | 4.855 | 0.000 | 4.855 |
| ***Articles:*** | 3 | 2 | 2 | - | 2 |
| ***FY 2016 Accomplishments:***<br>- Continued SAR/MTI payload component development, in preparation for integrated payload development in FY17.<br>- Completed construction of initial prototype payloads (V2.2). | | | | | |
| ***FY 2017 Plans:***<br>- Complete SAR/MTI payload component development and initiate integrated payload development (V3.0).<br>- Complete construction of improved prototype payload. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiated concurrent dual mode functionality of SAR and MTI.<br>***FY 2018 Base Plans:***<br>- Complete integrated payload development.<br>- Complete concurrent dual mode functionality of SAR and MTI.<br>- Complete construction of dual mode functionality prototype payload (V3.1).<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Initiated development of SAR/MTI payload software.<br>- Initiated engineering analysis of alternatives for SAR/MTI payload components.<br>***FY 2017 Plans:***<br>- Complete development of SAR/MTI payload software.<br>- Complete engineering analysis of alternatives for SAR/MTI payload components.<br>***FY 2018 Base Plans:***<br>- Initiate ILS, training concept development and data management/documentation.<br>***FY 2018 OCO Plans:***<br>N/A | 0.268<br>- | 0.590<br>- | 0.604<br>- | 0.000<br>- | 0.604<br>- |
| ***Title:*** Management Services<br>***Articles:***<br>***FY 2016 Accomplishments:***<br>- Completed refinement and documentation of acquisition strategy.<br>- Initiated mapping of payload requirements to specifications.<br>- Initiated development of an integrated master schedule.<br>- Initiated information assurance certification and accreditation.<br>***FY 2017 Plans:***<br>- Complete mapping of payload requirements to specifications.<br>- Complete development of an integrated master schedule. | 0.015<br>- | 0.104<br>- | 0.104<br>- | 0.000<br>- | 0.104<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Initiate engineering required for flight clearances.<br>***FY 2018 Base Plans:***<br>- Complete engineering required for flight clearances.<br>- Complete information assurance certification for accreditation.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test and Evaluation | 0.000 | 0.292 | 0.297 | 0.000 | 0.297 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>- Initiate and complete contractor component and subsystem level testing.<br>***FY 2018 Base Plans:***<br>- Initiate and complete developmental testing.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 5.682 | 5.119 | 5.860 | 0.000 | 5.860 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4787: *UAS Payloads* | 0.000 | 2.971 | 14.193 | - | 14.193 | 4.140 | 0.037 | 2.247 | 3.031 | 0.000 | 26.619 |

**Remarks**

**D. Acquisition Strategy**

The UAS Payload program utilizes a Hybrid Acquisition Model of Incremental/Spiral approach that leverages upon work conducted by various government laboratories in order to field capability that meet threshold requirements, and facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)* |

**E. Performance Metrics**

Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy and achievement of a technology readiness level of a TRL 7 or higher for Program of Record Transition. Successful development of a SAR/MTI payloads, integration into Marine Corps small tactical UASs, and completion testing.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | Project (Number/Name)<br>5504 / *Wide Area Persistent Surveillance (TNWAS)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5504: *Wide Area Persistent Surveillance (TNWAS)* | 0.000 | 0.000 | 0.000 | 7.100 | - | 7.100 | 2.919 | 4.328 | 0.788 | 0.000 | 0.000 | 15.135 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The UAS Payloads program will develop and integrate Wide Area Persistent Surveillance (WAS) payloads for Marine Corps small tactical UASs. This capability fills current capability gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and will allow Marine Corps ISR assets the ability to improve battlefield awareness, improve the capability to assure access and hold at risk, and enable power projection in environments that are not currently accessible is an essential capability that facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations. The current payload in development is the Tactical Nighttime Wide Area Surveillance (TNWAS) payload. Future WAS payloads include the Spectral and Reconnaissance Imagery for Tactical Exploitation (SPRITE) payload. The WAS payloads will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 0.000 | 0.000 | 5.331 | 0.000 | 5.331 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>- Initiate Wide Areas Surveillance payload component development. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Support | 0.000 | 0.000 | 1.520 | 0.000 | 1.520 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5504 / *Wide Area Persistent Surveillance (TNWAS)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 Base Plans:***<br>N/A<br>***FY 2018 OCO Plans:***<br>- Initiate development of Wide Area Surveillance software. | | | | | |
| ***Title:*** Management Services | 0.000 | 0.000 | 0.249 | 0.000 | 0.249 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>N/A<br>***FY 2018 Base Plans:***<br>- Initiate and complete refinement and documentation of acquisition strategy.<br>- Initiate mapping of requirements to specifications.<br>- Initiate development of an integrated master schedule.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 7.100 | 0.000 | 7.100 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PMC/4787: *UAS Payloads* | 0.000 | 2.971 | 14.193 | - | 14.193 | 4.140 | 0.037 | 2.247 | 3.031 | 0.000 | 26.619 |

**Remarks**

**D. Acquisition Strategy**

The UAS Payload program utilizes a Hybrid Acquisition Model of Incremental/Spiral approach that leverages upon work conducted by various government laboratories in order to field capability that meet threshold requirements, and facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads* | **Project (Number/Name)**<br>5504 / *Wide Area Persistent Surveillance (TNWAS)* |

**E. Performance Metrics**

Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy and achievement of a technology readiness level of a TRL 7 or higher for Program of Record Transition. Successful development of WAS payloads, integration into Marine Corps small tactical UASs, and completion of testing.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | | Date: May 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0305421N *I (U)RQ-4 Modernization* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 30.000 | 119.892 | 181.266 | 229.404 | - | 229.404 | 176.195 | 123.890 | 89.740 | 71.544 | 0.000 | 1,021.931 |
| 2939: *RQ-4 Modernization* | 30.000 | 119.892 | 181.266 | 229.404 | - | 229.404 | 176.195 | 123.890 | 89.740 | 71.544 | 0.000 | 1,021.931 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 373 | | | | | | | | | | | | |

**Note**

MQ-4C Triton RDTE funding for modernization was segregated into a new program element (from PE 0305220N to PE 0305421N) for increased transparency.

**A. Mission Description and Budget Item Justification**

MQ-4C Triton Unmanned Air System (UAS). The popular name Triton was approved for the MQ-4C UAS in June 2012, designating the RQ-4 Broad Area Maritime Surveillance (BAMS) UAS as the MQ-4C Triton.

The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's FORCEnet strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

MQ-4C will play a significant role in the Sea Shield and FORCEnet pillars of Sea Power 21. In its Sea Shield role, the system will rely on its key attribute of persistence to provide the supported combatant command or fleet commander with unparalleled situational awareness of the maritime battle space as it develops and sustains the common operational tactical picture. The system will also serve as a Fleet response plan enabler, while acting as a trip wire for intelligence preparation of the

environment. Additionally, Triton Unmanned Air System will be a FORCEnet enabler and relay platform, directly connected to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 129.892 | 181.266 | 166.651 | - | 166.651 |
| Current President's Budget | 119.892 | 181.266 | 229.404 | - | 229.404 |
| Total Adjustments | -10.000 | 0.000 | 62.753 | - | 62.753 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -10.000 | 0.000 | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 62.500 | - | 62.500 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.253 | - | 0.253 |

**Change Summary Explanation**

The Triton program was revised to align key program events and funding ($62.5M) with the development of the Multi-INT capability upgrade in order to continue to support the Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan. Key Performance Parameters and Key System Attributes were not affected and capabilities essential to FY11 National Defense Authorization Act compliance is prioritized. To preserve the MISR&T transition plan, the Navy is prioritizing remaining work and adjusting the Triton fielding plan by:

1) Truncating the Triton Baseline program to deliver a safe, stable, and effective system that establishes the foundation for Triton Multi-INT development; and provides an early operational capability to facilitate Fleet introduction and learning in FY18.

2) Retrofitting low-rate initial production (LRIP) lot 1 and 2 air vehicles (Baseline) to a Multi-INT configuration upon delivery. Retrofit of LRIP lot 1 and 2 increases Triton Multi-INT capacity from three to five air vehicles by the end of FY20.

3) Deploying a Triton Multi-INT early operational capability in FY20.

4) Deferring initial operational test and evaluation and initial operational capability to the Multi-INT configuration in FY20/21.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305421N / *(U)RQ-4 Modernization* | Project (Number/Name)<br>2939 / *RQ-4 Modernization* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2939: *RQ-4 Modernization* | 30.000 | 119.892 | 181.266 | 229.404 | - | 229.404 | 176.195 | 123.890 | 89.740 | 71.544 | 0.000 | 1,021.931 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 373

**A. Mission Description and Budget Item Justification**

MQ-4C Triton Unmanned Air System (UAS). The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's FORCEnet strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

MQ-4C will play a significant role in the Sea Shield and FORCEnet pillars of Sea Power 21. In its Sea Shield role, the system will rely on its key attribute of persistence to provide the supported combatant command or fleet commander with unparalleled situational awareness of the maritime battle space as it develops and sustains the common operational tactical picture. The system will also serve as a Fleet response plan enabler, while acting as a trip wire for intelligence preparation of the environment. Additionally, Triton UAS will be a FORCEnet enabler and relay platform, directly connected to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Product Development | 112.871 | 162.557 | 215.359 | 0.000 | 215.359 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Description:*** MQ-4C Triton Unmanned Air System (UAS) modernization effort for incorporation of phased capability upgrades. The prime contractor is responsible for integration of upgrades into the Triton UAS including associated management, engineering and logistics activities. Capability upgrades will also include development of system payloads directly with original equipment manufacturers.<br><br>***FY 2016 Accomplishments:***<br>Funding continues development of phased capability upgrades, including Multi-Intelligence capabilities in support of the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. Funding includes Sense and Avoid radar development and acquisition of development assets for capability upgrades including electro-optical/infra-red, Signals Intelligence (SIGINT) High Band and SIGINT Low Band systems.<br><br>***FY 2017 Plans:***<br>Funding increase from FY16 to FY17 supports higher levels of development effort for the integration of modernization capabilities as the program approaches Critical Design Review for Multi-INT. FY17 continues development of phased capability upgrades, including Multi-Intelligence capabilities in support of the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. Funding includes Sense and Avoid radar development, Airborne Mission Processor (AMP) development and acquisition of development assets for capability upgrades including electro-optical/infra-red, SIGINT High Band and SIGINT Low Band systems.<br><br>***FY 2018 Base Plans:***<br>Funding increase from FY17 to FY18 supports higher levels of development effort for the integration of modernization capabilities. FY18 continues development of phased capability upgrades as the program initiates test asset modification and software development, including Multi-Intelligence capabilities in support of the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. Funding includes Sense and Avoid radar development, AMP development and integration of development assets for capability upgrades including electro-optical/infra-red, SIGINT High Band and SIGINT Low Band systems.<br><br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** ILS, Support, Studies & Analysis | 2.908 | 3.066 | 3.127 | 0.000 | 3.127 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Integrated Logistics Support, Studies and Analysis.<br><br>***FY 2016 Accomplishments:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Integrated logistics support, technical engineering services, sensor risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton Unmanned Air System (UAS) capabilities.<br>***FY 2017 Plans:***<br>Funding increases from FY16 to FY17 support the increased effort in the development and integration of logistics and product support considerations for Triton's modernization upgrade. Efforts include integrated logistics support, technical engineering services, sensor reliability and maintainability risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS modernization capabilities.<br>***FY 2018 Base Plans:***<br>Funding continues in FY18 to support the development and integration of logistics and product support considerations for Triton's modernization upgrade. Efforts include integrated logistics support, technical engineering services, sensor reliability and maintainability risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS modernization capabilities.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Test & Evaluation (T&E) | 2.400 | 13.902 | 9.155 | 0.000 | 9.155 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** T&E efforts.<br>***FY 2016 Accomplishments:***<br>Begin Developmental Testing (DT) and Operational Testing (OT) support activities to allow test and fielding of the MQ-4C Triton UAS phased capability upgrades in accordance with the program schedule.<br>***FY 2017 Plans:***<br>Funding increases from FY16 to FY17 are in support of program increases in DT activities, including integrated test team labor to reduce risk in design and development, to perform subsystem level ground and acceptance | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| testing, obtain the necessary satellite communications required for testing and continue OT support to allow test and fielding of the MQ-4C Triton UAS phased capability upgrades in accordance with the program schedule.<br>***FY 2018 Base Plans:***<br>Funding continues in FY18 to support Developmental Testing activities, including integrated test team labor to reduce risk in design and development, to perform subsystem level ground and acceptance testing, obtain the necessary satellite communications required for testing and continue Operational Testing support to allow test and fielding of the MQ-4C Triton Unmanned Air System phased capability upgrades in accordance with the program schedule.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** Program Management (PM)<br>***Articles:***<br>***Description:*** PM support and travel.<br>***FY 2016 Accomplishments:***<br>Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts.<br>***FY 2017 Plans:***<br>Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts.<br>***FY 2018 Base Plans:*** | 1.713<br>- | 1.741<br>- | 1.763<br>- | 0.000<br>- | 1.763<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 119.892 | 181.266 | 229.404 | 0.000 | 229.404 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • RDT&E/0305220N: *(U)MQ-4C Triton* | 237.118 | 111.729 | 84.115 | - | 84.115 | 17.604 | 15.965 | 11.577 | 14.288 | 0.000 | 3,413.396 |
| • APN-4/044200: *MQ-4 Triton* | 619.662 | 464.657 | 579.392 | - | 579.392 | 681.233 | 588.256 | 622.602 | 611.734 | 6,654.217 | 10,902.923 |
| • APN-6/060500: *Spares and Repair Parts* | 103.954 | 114.529 | 56.915 | - | 56.915 | 39.009 | 26.238 | 1.839 | 0.000 | 0.000 | 342.484 |
| • MILCON/0212176N: *Facilities New Footprint - Fleet Ops* | 8.296 | 30.475 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 88.385 |
| • MILCON/0712876N: *Facilities New Footprint - Main and Prod* | 40.641 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 27.686 | 0.000 | 0.000 | 68.327 |
| • MILCON/0815976N: *Facilities New Footprint - Training* | 0.000 | 41.380 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 79.411 |
| • MILCON/0805976N: *Facilities Restoration and Mod-Training* | 2.974 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 2.974 |
| • APN-5/059600: *MQ-4 Series* | 0.000 | 0.000 | 39.996 | - | 39.996 | 43.947 | 7.874 | 0.000 | 0.000 | 0.000 | 91.817 |
| • OMN/1D4D: *Weapons Maintenance* | 0.000 | 0.000 | 13.367 | - | 13.367 | 20.476 | 36.902 | 130.093 | 151.932 | Continuing | Continuing |

**Remarks**

**D. Acquisition Strategy**

The MQ-4C Triton acquisition approach supports the Navy's Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan by providing a stable and effective baseline early operational capability in FY18 to facilitate Fleet introduction and learning while continuing System Development and

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

Demonstration engineering and integrated test on Signals Intelligence (SIGINT) and other upgrades to deliver a Multi-INT configuration at Initial Operational Capability (IOC). Phased capability upgrades will continue post IOC to enable the MQ-4C Triton to keep pace with rapidly evolving technologies and threats, and address correction of deficiencies and obsolescence issues to ensure the Navy maintains persistent Intelligence, Surveillance and Reconnaissance dominance through the system's lifecycle.

The MQ-4C Triton program office is pursuing joint efficiency with the Air Force on the Global Hawk Unmanned Aircraft System (UAS). However, the integration of the Triton UAS into the Maritime Patrol Reconnaissance Force and the unique maritime sensors employed dictate a Navy-led acquisition program focused on joint efficiencies, where possible.

**E. Performance Metrics**

Successfully achieved Integrated Test, Operational Evaluation and Initial Operation Capability.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Hardware Development | C/CPFF | Northrop Grumman : Rancho Bernardo, CA | 25.320 | 67.864 | Nov 2015 | 114.351 | Nov 2016 | 176.695 | Nov 2017 | - | | 176.695 | 532.953 | 917.183 | 917.183 |
| Systems Engineering | Various | Various : Various | 2.824 | 2.000 | Nov 2015 | 2.957 | Nov 2016 | 2.509 | Nov 2017 | - | | 2.509 | 1.297 | 11.587 | - |
| Systems Engineering | WR | NAWC-AD : Patuxent River, MD | 1.138 | 21.265 | Nov 2015 | 17.644 | Nov 2016 | 23.273 | Nov 2017 | - | | 23.273 | 26.896 | 90.216 | - |
| Primary Hardware Development | SS/FFP | Raytheon : McKinney, TX | 0.000 | 7.400 | Feb 2016 | 1.300 | Nov 2016 | 1.000 | Nov 2017 | - | | 1.000 | 0.500 | 10.200 | 10.200 |
| Primary Hardware Development | C/CPFF | Sierra Nevada Corporation : Beaver Creek, OH | 0.000 | 2.500 | Apr 2016 | 7.000 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 9.500 | 9.500 |
| Primary Hardware Development | C/CPFF | Boeing Argon ST : Fairfax, VA | 0.000 | 4.628 | Feb 2016 | 2.870 | Nov 2016 | 0.000 | | - | | 0.000 | 0.000 | 7.498 | 7.498 |
| Primary Hardware Development | WR | NSWC-Crane : Crane, Indiana | 0.000 | 3.636 | Feb 2016 | 12.786 | Nov 2016 | 8.160 | Nov 2017 | - | | 8.160 | 1.500 | 26.082 | - |
| Sytems Engineering | C/CPFF | Mitre : Mclean, VA | 0.000 | 1.122 | May 2016 | 1.144 | Nov 2016 | 1.167 | Nov 2017 | - | | 1.167 | 1.190 | 4.623 | 4.623 |
| Systems Engineering | C/CPFF | MIT-Lincoln Labs : Lexington, MA | 0.000 | 2.456 | Nov 2015 | 2.505 | Nov 2016 | 2.555 | Nov 2017 | - | | 2.555 | 2.606 | 10.122 | 10.122 |
| | | **Subtotal** | 29.282 | 112.871 | | 162.557 | | 215.359 | | - | | 215.359 | 566.942 | 1,087.011 | - |

**Remarks**

The Product Development budget resources Northrop Grumman for Triton Air to Air Radar Subsystem (AARSS) development and Multi-INT integration design efforts, Raytheon for an Electro-Optical/Infrared (EO/IR) upgrade contract, Sierra Nevada Corporation for high band sensor kits, Boeing Argon for low band sensor kits, NSWC-Crane for Airborne Mission Processor design and MITRE/MIT-LL for Airspace Integration efforts.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Support | Various | Various : Various | 0.540 | 0.508 | Nov 2015 | 0.518 | Nov 2016 | 0.529 | Nov 2017 | - | | 0.529 | 2.339 | 4.434 | - |
| Integrated Logistics Support | Various | Various : Various | 0.000 | 1.200 | Nov 2015 | 1.224 | Nov 2016 | 1.248 | Nov 2017 | - | | 1.248 | 5.072 | 8.744 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305421N / *(U)RQ-4 Modernization* | Project (Number/Name)<br>2939 / *RQ-4 Modernization* | |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Integrated Logistics Support | WR | NAWC-AD : Patuxent River, MD | 0.000 | 1.200 | Nov 2015 | 1.324 | Nov 2016 | 1.350 | Nov 2017 | - | | 1.350 | 6.822 | 10.696 | - |
| | | **Subtotal** | 0.540 | 2.908 | | 3.066 | | 3.127 | | - | | 3.127 | 14.233 | 23.874 | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | Various | Various : Various | 0.000 | 0.650 | Nov 2015 | 0.663 | Nov 2016 | 0.676 | Nov 2017 | - | | 0.676 | 5.243 | 7.232 | - |
| Developmental Test & Evaluation | WR | NAWC-AD : Patuxent River, MD | 0.000 | 0.500 | Nov 2015 | 10.667 | Nov 2016 | 5.857 | Nov 2017 | - | | 5.857 | 40.145 | 57.169 | - |
| Operational Test & Evaluation | Various | Various : Various | 0.000 | 0.250 | Nov 2015 | 0.500 | Nov 2016 | 0.510 | Nov 2017 | - | | 0.510 | 8.700 | 9.960 | - |
| Developmental Test & Evaluation (SATCOMM) | MIPR | DITCO : Various | 0.000 | 1.000 | Nov 2015 | 2.072 | Nov 2016 | 2.112 | Nov 2017 | - | | 2.112 | 7.000 | 12.184 | - |
| | | **Subtotal** | 0.000 | 2.400 | | 13.902 | | 9.155 | | - | | 9.155 | 61.088 | 86.545 | - |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program Management | Various | Various : Various | 0.167 | 0.163 | Nov 2015 | 0.166 | Nov 2016 | 0.170 | Nov 2017 | - | | 0.170 | 0.529 | 1.195 | - |
| Travel | Allot | Various : Various | 0.011 | 0.050 | Nov 2015 | 0.045 | Nov 2016 | 0.033 | Nov 2017 | - | | 0.033 | 0.253 | 0.392 | - |
| Program Management Support | C/CPFF | Ausley : Lexington Park, MD | 0.000 | 1.500 | Apr 2016 | 1.530 | Nov 2016 | 1.560 | Nov 2017 | - | | 1.560 | 6.870 | 11.460 | 11.460 |
| | | **Subtotal** | 0.178 | 1.713 | | 1.741 | | 1.763 | | - | | 1.763 | 7.652 | 13.047 | - |

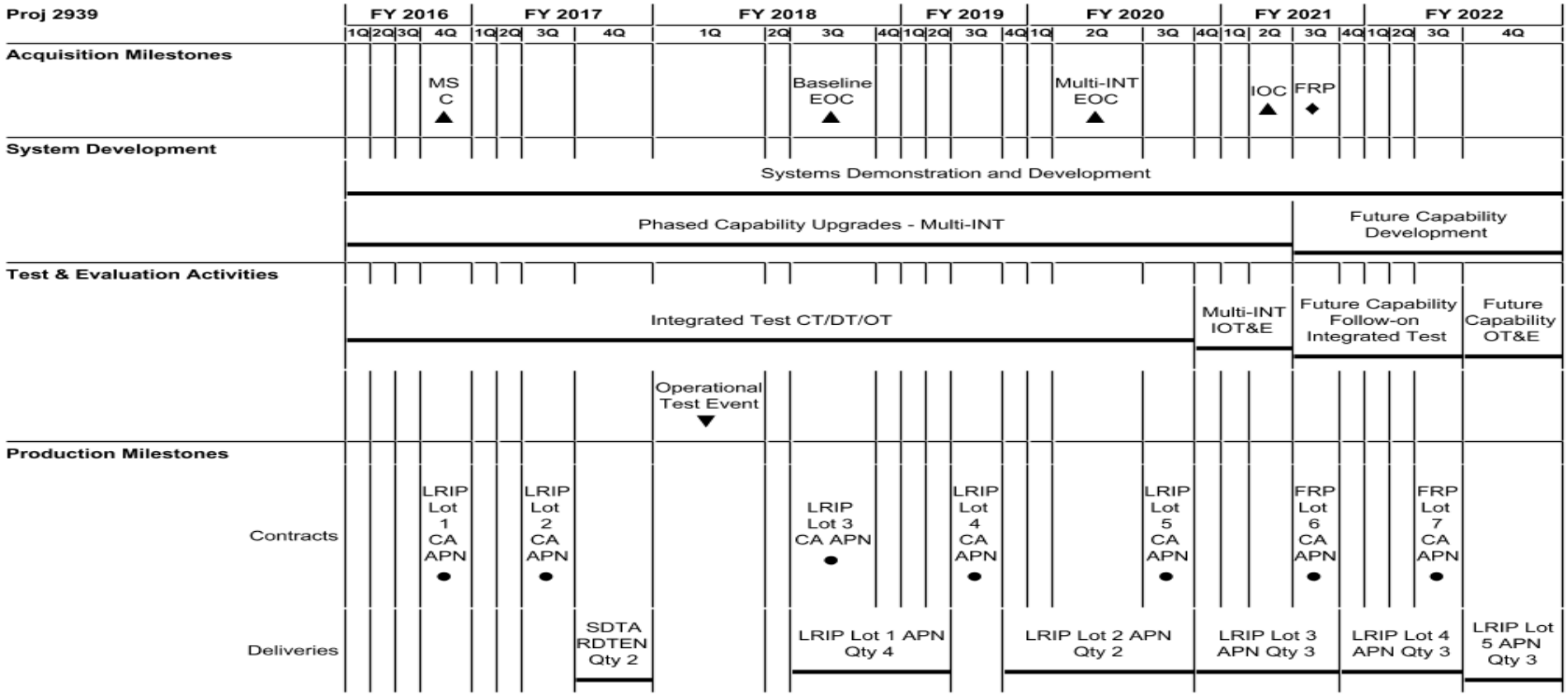
| | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 30.000 | 119.892 | | 181.266 | | 229.404 | | - | | 229.404 | 649.915 | 1,210.477 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0305421N / *(U)RQ-4 Modernization* | Project (Number/Name)<br>2939 / *RQ-4 Modernization* | |

| | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |




*2018DON - 0305421N - 2939 MQ-4C Triton development activities are resourced by PE 0305220N and PE 0305421N.*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2939*** | | | | |
| Acquisition Milestones: Milestone C | 4 | 2016 | 4 | 2016 |
| Acquisition Milestones: Full Rate Production | 3 | 2021 | 3 | 2021 |
| Acquisition Milestones: Initial Operational Capability | 2 | 2021 | 2 | 2021 |
| Acquisition Milestones: Multi-INT Early Operational Capability | 2 | 2020 | 2 | 2020 |
| Acquisition Milestones: Baseline Early Operational Capability | 3 | 2018 | 3 | 2018 |
| System Development: System Development and Demonstration | 1 | 2016 | 4 | 2022 |
| System Development: Phased Capability Upgrades - Multi-INT | 1 | 2016 | 2 | 2021 |
| System Development: Future Capability Development | 3 | 2021 | 4 | 2022 |
| Test & Evaluation Activities: Integrated Test (Combined/Developmental/Operational) | 1 | 2016 | 3 | 2020 |
| Test & Evaluation Activities: Multi-INT Initial Operational Test and Evaluation | 4 | 2020 | 2 | 2021 |
| Test & Evaluation Activities: Future Capabilities Follow-on Integrated Test | 3 | 2021 | 3 | 2022 |
| Test & Evaluation Activities: Future Capabilities Operational Test and Evaluation | 4 | 2022 | 4 | 2022 |
| Test & Evaluation Activities: Operational Test Event | 1 | 2018 | 1 | 2018 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 1 Contract Award | 4 | 2016 | 4 | 2016 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 2 Contract Award | 3 | 2017 | 3 | 2017 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 3 Contract Award | 3 | 2018 | 3 | 2018 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 4 Contract Award | 3 | 2019 | 3 | 2019 |
| Production Milestones: Contracts: Low Rate Initial Production Lot 5 Contract Award | 3 | 2020 | 3 | 2020 |
| Production Milestones: Contracts: Full Rate Production Lot 6 Contract Award | 3 | 2021 | 3 | 2021 |
| Production Milestones: Contracts: Full Rate Production Lot 7 Contract Award | 3 | 2022 | 3 | 2022 |
| Production Milestones: Deliveries: System Demonstration Test Articles Delivery | 4 | 2017 | 4 | 2017 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 1 Delivery | 3 | 2018 | 2 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0305421N / *(U)RQ-4 Modernization* | **Project (Number/Name)**<br>2939 / *RQ-4 Modernization* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 2 Delivery | 4 | 2019 | 3 | 2020 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 3 Delivery | 4 | 2020 | 3 | 2021 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 4 Delivery | 4 | 2021 | 3 | 2022 |
| Production Milestones: Deliveries: Low Rate Initial Production Lot 5 Delivery | 4 | 2022 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0308601N *I Modeling & Simulation Support* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 30.740 | 4.585 | 4.709 | 5.238 | - | 5.238 | 5.280 | 5.280 | 5.386 | 5.494 | Continuing | Continuing |
| 2222: *Modeling & Simulation* | 30.740 | 4.585 | 4.709 | 5.238 | - | 5.238 | 5.280 | 5.280 | 5.386 | 5.494 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

This Program Element addresses projects under the Navy Modeling and Simulation (M&S) Office. It supports technical and management initiatives directed by Congress, Department of Defense (DoD), Secretary of the Navy (SECNAV), and Chief of Naval Operations (CNO) with the aim of bringing organization, focus, and efficiency to the development and use of M&S throughout the Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S, and represents Navy interests in Joint and other Agency initiatives. It funds efforts to define and coordinate the corporate Navy M&S policy and guidance to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD.

Efforts are organized around three product areas:
(1) Core Services: This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S standards, visibility, and potential reuse across DoD.
(2) Community Services: This activity provides M&S subject matter expert support embedded in the DON M&S Communities to recommend implementations for M&S policies, standards, VV&A, and reuse within their Community and to ensure that the wider DON and DoD are aware (visibility) of the M&S products and services, initiatives, processes, and standards.
(3) Community Experiments and Prototypes: This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S and investigates Service-unique requirements for standards or guidance to achieve M&S efficiencies.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.757 | 4.709 | 5.238 | - | 5.238 |
| Current President's Budget | 4.585 | 4.709 | 5.238 | - | 5.238 |
| Total Adjustments | -0.172 | 0.000 | 0.000 | - | 0.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.172 | 0.000 | | | |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0308601N *I Modeling & Simulation Support* |

**Change Summary Explanation**

The FY 2017 request was reduced by -$0.270 million to account for the availability of prior year execution balances.

Technical: Not applicable.

Schedule: Not applicable.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0308601N / *Modeling & Simulation Support* | Project (Number/Name)<br>2222 / *Modeling & Simulation* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2222: *Modeling & Simulation* | 30.740 | 4.585 | 4.709 | 5.238 | - | 5.238 | 5.280 | 5.280 | 5.386 | 5.494 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

This Program Element addresses projects under the Navy Modeling and Simulation (M&S) Office. It supports technical and management initiatives directed by Congress, Department of Defense (DoD), Secretary of the Navy (SECNAV), and Chief of Naval Operations (CNO) with the aim of bringing organization, focus, and efficiency to the development and use of M&S throughout the Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S, and represents Navy interests in Joint and other Agency initiatives. It funds efforts to define and coordinate the corporate Navy M&S policy and guidance to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD.

Efforts are organized around three product areas:
(1) Core Services: This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S standards, visibility, and potential reuse across DoD.
(2) Community Services: This activity provides M&S subject matter expert support embedded in the DON M&S Communities to recommend implementations for M&S policies, standards, VV&A, and reuse within their Community and to ensure that the wider DON and DoD are aware (visibility) of the M&S products and services, initiatives, processes, and standards.
(3) Community Experiments and Prototypes: This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S and investigates Service-unique requirements for standards or guidance to achieve M&S efficiencies.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** CORE SERVICES | 1.597 | 1.607 | 1.781 | 0.000 | 1.781 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S visibility and potential reuse across DoD. It provides updates to the Navy M&S website, M&S Master Plan, and M&S Investment Strategy. This activity supports development of common services, tools, and databases to ensure the integration and connectivity of M&S products employed in Naval assessments, training, acquisition, and among operational communities. It manages and maintains the Navy M&S Information Service (NMSIS), the central Naval M&S information resource to support informed M&S investment decision making across DON. It implements and manages the Modeling and Simulation (M&S) Quality Assurance (VV&A) process and guidelines for implementing for modeling, simulation, and data. It | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0308601N / *Modeling & Simulation Support* | **Project (Number/Name)**<br>2222 / *Modeling & Simulation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| reviews both new and legacy M&S VV&A plans and reports and develops and maintains the Naval M&S VV&A repository. It establishes and implements a VV&A training curriculum for developers and Accreditation Agents.<br><br>***FY 2016 Accomplishments:***<br>- Develop a virtual environment POA&M for SECNAV to cover:<br>* Identifying centers of excellence within the DON, across the DoD, commercial industry.<br>* Develop a strategic plan for the DON on scaling up the use of virtual environments.<br>- Update the SECNAV Instruction on M&S to enable a more integrated DON approach to M&S<br>- Help develop core M&S workforce education , especially on contracting language, M&S Support Plans, and user level M&S guidance.<br>- Provide VV&A, Standards and M&S support to programs, PEOs and other DON activities.<br>- Collect and make available "best practices" and guides for digital and M&S efforts.<br><br>***FY 2017 Plans:***<br>- Document capabilities of centers of excellence in DON, DoD, and industry virtual environments and make discoverable and usable<br>- Identify where, and in what conditions, virtual environments demonstrate value and to what levels of fidelity for various use cases.<br>- Develop a roadmap for the DON that includes the opportunities, risks, and barriers associated with scaling up the use of virtual environments.<br>- Update the Verification, Validation and Accreditation (VV&A) Implementation Guide.<br>- Educate the M&S workforce on how to participate in the reuse of core M&S knowledge and efforts.<br>- Provide VV&A, Standards and M&S support to programs, PEOs and other DON activities.<br>- Collect and make available "best practices" and guides for digital and M&S efforts.<br><br>***FY 2018 Base Plans:***<br>Continue FY 2017 Plans<br>- Document capabilities of centers of excellence in DON, DoD, and industry virtual environments and make discoverable and usable<br>- Develop a roadmap for the DON that includes the opportunities, risks, and barriers associated with scaling up the use of virtual environments.<br>- Update the Verification, Validation and Accreditation (VV&A) Implementation Guide.<br>- Educate the M&S workforce on how to participate in the reuse of core M&S knowledge and efforts.<br>- Provide VV&A, Standards and M&S support to programs, PEOs and other DON activities. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0308601N / *Modeling & Simulation Support* | **Project (Number/Name)**<br>2222 / *Modeling & Simulation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Collect and make available "best practices" and guides for digital and M&S efforts.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** COMMUNITY SERVICES | 2.329 | 2.299 | 2.567 | 0.000 | 2.567 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This activity provides M&S subject matter expert support embedded in the DON M&S Communities to recommend implementations for M&S policies and standards within their Community and to ensure that the wider Navy is aware of the M&S products and services, initiatives, processes, and standards (visibility). It promotes M&S reuse through cooperative Community M&S activities which identify and prioritize M&S capability requirements between and across Communities. It also provides an M&S degree program through the Naval Postgraduate School (NPS), Modeling Virtual Environments and Simulation (MOVES) curriculum which qualifies officers to fill 6202-P coded billets. Financial support for thesis and dissertation efforts done by the students is covered by this funding. Topics are broad M&S topics of concern which are prioritized based on how they meet the requirements across, between and within the M&S Communities.<br>***FY 2016 Accomplishments:***<br>- Develop open standards and architectures for M&S Communities' use which will foster Virtual Environments and M&S Enterprise Solutions<br>- Consolidate investment requirements of the M&S Communities to identify common or similar gaps and develop common solutions.<br>- Develop DON Officer M&S postgraduate knowledge requirements and submit to the M&S program at Naval Postgraduate School.<br>- Fund DON M&S Forum tasks to share M&S efforts, Best Practices, and lessons learned.<br>***FY 2017 Plans:***<br>- Develop open standards and architectures for M&S Communities' use which will foster Virtual Environments and M&S Enterprise Solutions<br>- Consolidate investment requirements of the M&S Communities to identify common or similar gaps and develop common solutions..<br>- Develop DON Officer M&S postgraduate Knowledge requirements and submit to the M&S program at Naval Postgraduate School. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0308601N / *Modeling & Simulation Support* | **Project (Number/Name)**<br>2222 / *Modeling & Simulation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Fund DON M&S Forum tasks to share M&S efforts, Best Practices, and lessons learned.<br>***FY 2018 Base Plans:***<br>Continue FY 2017 Plans<br>- Develop open standards and architectures for M&S Communities' use which will foster Virtual Environments and M&S Enterprise Solutions<br>- Consolidate investment requirements of the M&S Communities to identify common or similar gaps and develop common solutions..<br>- Develop DON Officer M&S postgraduate Knowledge requirements and submit to the M&S program at Naval Postgraduate School.<br>- Fund DON M&S Forum tasks to share M&S efforts, Best Practices, and lessons learned.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| ***Title:*** COMMUNITY EXPERIMENTS and PROTOTYPES | 0.659 | 0.803 | 0.890 | 0.000 | 0.890 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S, and investigate Service-unique requirements for standards or guidance. Individual efforts focus on developing or evaluating approaches to optimize training, assessments and acquisition functional, mission objectives through more efficient development and use of M&S. This activity develops methodologies and standards that will result in model and data reusability and interoperability through the formulation of a technical framework. These standards support the full range of architecture and engineering design requirements across the Navy.<br>This activity also supports Fleet exercises and experiments through the application of distributed simulations across a wide variety of warfighting and supporting communities. Specifically, it develops and integrates appropriate M&S into Fleet Synthetic Training (FST), and develops simulation efforts to test and evolve the standards for models, interfaces, and data. It supports development of tools necessary to enable the seamless access and use of operationally relevant M&S products to support Navy training, warfare assessments and acquisition requirements.<br>***FY 2016 Accomplishments:***<br>- In conjunction with DoD and the other Services, develop M&S Enterprise Services for all to use and reuse. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0308601N / *Modeling & Simulation Support* | **Project (Number/Name)**<br>2222 / *Modeling & Simulation* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Develop a collaboration environment for use in identifying components and innovative concepts to develop the DON Virtual Environment.<br>- Collaborate on common development environment and maintain successes and lessons learned so follow-on efforts and users may benefit from them.<br>- Assist labs in obtaining the necessary connectivity to participate in the shared digital environments.<br>- Integrate model based System Engineering digital tools and processes.<br>***FY 2017 Plans:***<br>- In conjunction with DoD and the other Services, develop M&S Enterprise Services for all to use and reuse.<br>- Develop a guide on recommended contract language for M&S efforts to ensure appropriate simulation and data government rights and that the industry deliverables will plug into the government framework.<br>- Develop and test M&S Enterprise solutions for the users and developers of M&S in and for the DON.<br>- Improve collaboration environment for use in identifying components and innovative concepts to develop the DON. Virtual Environment and evolve it to meet projected program and M&S users' requirements.<br>- Assist labs in obtaining the necessary connectivity to be participate in the shared digital environments.<br>- Continue Integration of model based System Engineering digital tools and processes.<br>***FY 2018 Base Plans:***<br>Continue FY 2017 Plans<br>- In conjunction with DoD and the other Services, develop M&S Enterprise Services for all to use and reuse.<br>- Develop a guide on recommended contract language for M&S efforts to ensure appropriate simulation and data government rights and that the industry deliverables will plug into the government framework.<br>- Develop and test M&S Enterprise solutions for the users and developers of M&S in and for the DON.<br>- Improve collaboration environment for use in identifying components and innovative concepts to develop the DON. Virtual Environment and evolve it to meet projected program and M&S users' requirements.<br>- Collaborate on Common Development Environment and maintain successes and lessons learned so follow-on efforts and users may benefit from them.<br>- Assist labs in obtaining the necessary connectivity to be participate in the shared digital environments.<br>- Continue Integration of model based System Engineering digital tools and processes.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.585 | 4.709 | 5.238 | 0.000 | 5.238 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0308601N / *Modeling & Simulation Support* | **Project (Number/Name)**<br>2222 / *Modeling & Simulation* |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

This is a non-ACAT program. The focus of the Navy Modeling and Simulation (M&S) Office is to facilitate and enable the efficient use of M&S by minimizing duplication of M&S efforts and maximize the reuse of M&S and data.

**E. Performance Metrics**

This program supports efforts to define, develop, and utilize M&S technologies, standards and techniques in DON and joint programs across a wide range of disciplines and technical arenas. As such, performance metrics are specific to individual projects initiated under this program element. Representative examples of performance criteria for M&S support include the following: VV&A of deployed M&S systems to support Fleet and Force missions and assessments; degree of composability and adaptability of system architectures employed M&S systems; ability of M&S systems to replicate and permit recreation of force or system interactions that otherwise would be performed by more labor-intensive or expensive personnel, forces, or elements; degree to which M&S frameworks would permit rapid integration and employment of analytic capabilities for the analysis and documentationof warfighter missions, weapons systems or Tactics, Techniques and Procedures (TT&P); and ability od a specific M&S technology or technique to meet the requirements specified in an individual project supported by this program.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 0702207N *I Depot Maintenance (NON-IF)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 174.359 | 23.401 | 49.322 | 38.227 | - | 38.227 | 35.385 | 33.761 | 24.640 | 15.584 | Continuing | Continuing |
| 3030: *FA-18 SLAP* | 152.723 | 19.032 | 38.277 | 26.879 | - | 26.879 | 28.619 | 23.569 | 17.473 | 10.333 | Continuing | Continuing |
| 3182: *T-45 SLAP* | 21.636 | 4.369 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 26.005 |
| 3384: *MH-60 SLAP* | 0.000 | 0.000 | 11.045 | 11.348 | - | 11.348 | 6.766 | 10.192 | 7.167 | 5.251 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

3030: A significant portion of the F/A-18 airframe is believed to have additional inherent capability and a life extension may be possible for many portions of the airframe. The F/A-18 Service Life Assessment Program (SLAP) is assessing the structural and subsystem conditions of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve Chief of Naval Operations inventory requirements. Without SLAP and the follow on Service Life Extension Program, aircraft are retired from the USN inventory when a design service life metric is reached. RDTE funds will support aircraft teardown to validate SLAP analysis, identify unknown fatigue areas and assess the aircraft's material condition.

3182: The T-45 SLAP is assessing the subsystem condition of the T-45 fleet in order to determine what modifications are necessary to extend the aircraft subsystem design life limits to allow it to meet Chief of Naval Air Training Pilot and Naval Flight Officer training requirements through 2035.

3384: The MH-60 SLAP is assessing the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to extend the aircraft design life limits to allow it to meet Chief of Naval Operations operational inventory requirements through FY 2035. Without SLAP, aircraft are retired from the USN inventory when design service life limits are reached directly impacting fleet surface warfare, mine countermeasures, search and rescue, and vertical replenishment operational capabilities. FY 2018 budget request funds for the completion of external loads analysis, continuation of fatigue analysis, service life risk assessments of aircraft subsystems analysis and development of initial dispositions for safety critical items.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | Date: May 2017 |
|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | R-1 Program Element (Number/Name)<br>PE 0702207N *I Depot Maintenance (NON-IF)* | | | |
| **B. Program Change Summary ($ in Millions)** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** |
| Previous President's Budget | 24.185 | 49.322 | 45.174 | - | 45.174 |
| Current President's Budget | 23.401 | 49.322 | 38.227 | - | 38.227 |
| Total Adjustments | -0.784 | 0.000 | -6.947 | - | -6.947 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.784 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -6.607 | - | -6.607 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.340 | - | -0.340 |

**Change Summary Explanation**

Technical: Not applicable.

Schedule: FY 2018 reflects a delay in MH-60 SLAP. The associated FY 2018 funding profile has been updated to reflect this shift.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0702207N / *Depot Maintenance (NON-IF)* | Project (Number/Name)<br>3030 / *FA-18 SLAP* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3030: *FA-18 SLAP* | 152.723 | 19.032 | 38.277 | 26.879 | - | 26.879 | 28.619 | 23.569 | 17.473 | 10.333 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The F/A-18 Service Life Assessment Program (SLAP) is assessing the structural and subsystem conditions of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve Chief of Naval Operations (CNO) inventory requirements. The goal of the F/A-18 SLAP program is to identify critical structures and components that can achieve the extended service life limit goals. SLAP consists of structural investigations of the main landing gear, arresting hook and catapult back-up structures, vertical tails, wings and fuselage. A second effort is to evaluate the subsystem components (hydraulics, wiring, actuators, etc) to identify over and above inspections, overhaul intervals or replacement schedules to fly past design of 6,000 hours. The current life limits for the F/A-18 E/F are 6,000 Flight Hours (FH), 2,250 catapults/arrestments (Cat/Traps) and 15,750 total landings. The F/A-18 SLAP program of record states the SLAP goals as 12,000 FH, 3,500 Cat/Traps and 22,500 total landings. The primary objective of F/A-18 SLAP is to determine if the stated SLAP goals are feasible. An increase in total landings and flight hours would allow the F/A-18 to meet CNO inventory requirements. The requirements are integrated with the Joint Strike Fighter planned introduction. This effort is required to be conducted for these airframes and subsystems to ascertain what actions and modifications must be taken to safely operate each system beyond its designed life until the targeted end of service life.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** F/A-18 SLAP | 19.032 | 38.277 | 26.879 | 0.000 | 26.879 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The current design life limits do not support USN inventory requirements. Funding supports assessing the structural condition of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve CNO inventory requirements. | | | | | |
| ***FY 2016 Accomplishments:***<br>Continued stress analysis of numerous data points to provide exploitation of complete structural fatigue testing with the expectation of extending the current service life of F/A-18E/F from the design limits to the SLAP goals. Locations encompass the forward, center and aft fuselage, inner and outer wings, as well as landing gear. | | | | | |
| ***FY 2017 Plans:***<br>Continued stress analysis of numerous data points to provide exploitation of complete structural fatigue testing with the expectation of extending the current service life of F/A-18E/F from the design limits to the SLAP goals. Locations encompass the forward, center and aft fuselage, inner and outer wings, as well as landing gear. Sonic and Thermal analysis will be performed on numerous structural and composite skin locations to assess | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| elevated temperatures with the expectation of extending the current life of the F/A-18E/F Super Hornet. Aircraft Teardown assessments will be performed to analyze the fatigue and material condition of fleet aircraft to determine what modifications or inspections are required to extend the current life of the aircraft.<br>***FY 2018 Base Plans:***<br>Continue stress analysis of numerous data points to provide exploitation of complete structural fatigue testing with the expectation of extending the current service life of F/A-18E/F from the design limits to the SLAP goals. Locations encompass the forward, center and aft fuselage, inner and outer wings, as well as landing gear. Sonic and Thermal analysis will be performed on numerous structural and composite skin locations to assess elevated temperatures with the expectation of extending the current life of the F/A-18E/F Super Hornet. Aircraft Teardown assessments continue to be performed to analyze the fatigue and material condition of fleet aircraft to determine what modifications or inspections are required to extend the current life of the aircraft. Crack growth analysis will be performed to determine recurring requirements to extend the platform beyond its current service life limits.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 19.032 | 38.277 | 26.879 | 0.000 | 26.879 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/0525: *F-18 Series (OSIP 020-14)* | 23.415 | 39.519 | 87.424 | - | 87.424 | 137.254 | 137.910 | 163.956 | 161.836 | 1,747.903 | 2,509.154 |

**Remarks**

**D. Acquisition Strategy**

The Service Life Assessment Program (SLAP) program employs sole source contracts with Boeing, the aircraft prime manufacturer. SLAP further decomposes program of record goals into smaller discrete steps, developing requirements to extend flight hours (FH) from 6,000 to 9,000 first. These efforts will provide the raw engineering data to develop aircraft modifications to extend total aircraft landings, Cat/Traps, and FH. The F/A-18 SLAP Program consists of two major engineering efforts: the aircraft structural assessment and the aircraft subsystems assessment. Both efforts are broken into multiple phases which develop tools and models, evaluate current aircraft usage, and develop concepts to extend aircraft life to meet CNO objectives. The program will combine exploitation of complete structural fatigue testing and actual fleet usage with the expectation of extending the service life of the F/A-18 aircraft. Conducting F/A-18 SLAP to study the aircraft lifetime will provide a better estimate of aircraft service life and a follow on Service Life Extension Program (SLEP).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |

**E. Performance Metrics**

The F/A-18 SLAP provides an assessment of aircraft structure fatigue life as affected by flight maneuver, Cat/Traps and landings, based on actual usage and identifies the efforts required to extend the aircraft life to SLAP goals. During SLAP Structures Phase A (FY08-FY13) tools and modeling necessary to assess usage and fatigue life are developed. During SLAP Structures Phase B (FY11-FY18) specific structural locations which do not meet SLAP goals are identified and evaluated. Subsystem SLAP is also initiated concurrently with Structures Phase (B). A Flight Control Surface SLAP, SLEP retrofit concepts and repairs for deficient locations are developed during SLAP Structures and Sub-Systems Phase C (FY14-FY22). SLAP is followed by the SLEP during which the actual retrofit and repairs are performed under OSIP 020-14 established in FY14.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product Development SLAP F/A-18E-F | SS/CPFF | Boeing : St. Louis, MO | 94.509 | 14.976 | Dec 2015 | 34.883 | Dec 2016 | 22.935 | Dec 2017 | - | | 22.935 | Continuing | Continuing | Continuing |
| Prior Year Prod Dev cost no longer funded in FYDP | SS/CPFF | Boeing : St. Louis, MO | 28.775 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 28.775 | 28.775 |
| | | **Subtotal** | 123.284 | 14.976 | | 34.883 | | 22.935 | | - | | 22.935 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SLAP Inventory Model | WR | ONR : Arlington, VA | 6.525 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.525 | - |
| SLAP F/A-18 E/F | WR | NAWCAD : Patuxent River, MD | 7.810 | 0.795 | Dec 2015 | 0.586 | Dec 2016 | 0.767 | Dec 2017 | - | | 0.767 | Continuing | Continuing | Continuing |
| SLAP F/A-18 E/F | WR | FRC Southwest : San Diego, CA | 5.880 | 0.693 | Dec 2015 | 0.766 | Dec 2016 | 0.948 | Dec 2017 | - | | 0.948 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 20.215 | 1.488 | | 1.352 | | 1.715 | | - | | 1.715 | - | - | - |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development Test & Evaluation - SLAP E/F | WR | NAWCAD : Pax River, MD | 0.814 | 0.157 | Dec 2015 | 0.157 | Dec 2016 | 0.157 | Dec 2017 | - | | 0.157 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.814 | 0.157 | | 0.157 | | 0.157 | | - | | 0.157 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |

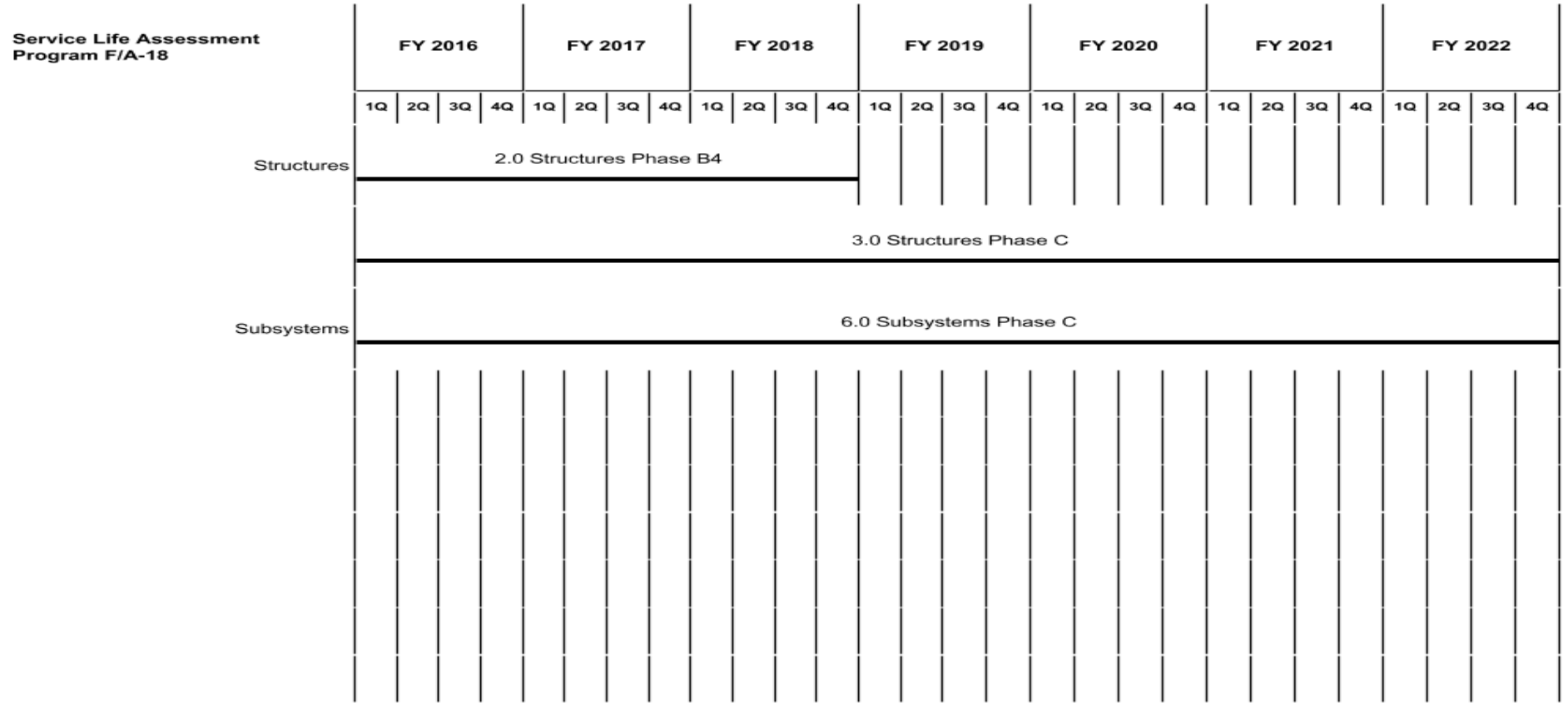
**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Government Engineering and Technical Support SLAP F/A-18 E/F | WR | NAWCAD : Pax River, MD | 3.758 | 1.178 | Dec 2015 | 1.177 | Dec 2016 | 1.692 | Dec 2017 | - | | 1.692 | Continuing | Continuing | Continuing |
| Travel | Various | NAVAIR : Pax River, MD | 0.150 | 0.050 | Dec 2015 | 0.075 | Jun 2017 | 0.075 | Jun 2018 | - | | 0.075 | Continuing | Continuing | Continuing |
| Program Management Support (Seaport-CSS) | C/CPFF | WYLE LAB : Pax River, MD | 2.159 | 0.508 | Dec 2015 | 0.050 | Dec 2016 | 0.050 | Dec 2017 | - | | 0.050 | Continuing | Continuing | Continuing |
| Program Management Support | Various | NAWCAD : Pax River, MD | 2.082 | 0.675 | Dec 2015 | 0.040 | Dec 2016 | 0.050 | Dec 2017 | - | | 0.050 | Continuing | Continuing | Continuing |
| Program Management Support | C/CPFF | Engility : Pax River, MD | 0.261 | 0.000 | | 0.543 | Dec 2016 | 0.205 | Dec 2017 | - | | 0.205 | 0.000 | 1.009 | 1.009 |
| | | **Subtotal** | 8.410 | 2.411 | | 1.885 | | 2.072 | | - | | 2.072 | - | - | - |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 152.723 | 19.032 | | 38.277 | | 26.879 | | - | | 26.879 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |




2018DON - 0702207N - 3030

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3030 / *FA-18 SLAP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Service Life Assessment Program F/A-18*** | | | | |
| Structures: 2.0 Structures Phase B4 | 1 | 2016 | 4 | 2018 |
| Structures: 3.0 Structures Phase C | 1 | 2016 | 4 | 2022 |
| Subsystems: 6.0 Subsystems Phase C | 1 | 2016 | 4 | 2022 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0702207N / *Depot Maintenance (NON-IF)* | Project (Number/Name)<br>3182 / *T-45 SLAP* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3182: *T-45 SLAP* | 21.636 | 4.369 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 26.005 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

3182: The T-45 aircraft structure is currently fatigue limited to 14,400 flight hours based on initial full-scale fatigue tests conducted from 1992-1996. This service life limit prevents the T-45 fleet from meeting Integrated Production Plan (IPP), previously Pilot Training Requirements, past 2025. Recent studies have determined that the fleet squadrons have not been flying the T-45 aircraft as aggressively as the initial fatigue studies predicted. These studies demonstrate that the 14,400 flight hour service life can likely be extended, with a Service Life Extension Program (SLEP), to 21,600 flight hours, which will support meeting IPP until 2035. A T-45 Structural Service Life Assessment Program (SLAP) was completed in February 2012. The results are being used to provide guidance on what structural areas to SLEP. In order for the T-45 to meet IPP until 2035, it is also necessary to assess the subsystems of the T-45 in their ability to remain viable. Beginning in FY13, the T-45 subsystem SLAP effort assessed the subsystem condition of the T-45 fleet in order to determine subsystem modifications and/or redesign necessary to extend the aircraft designed service life to support IPP and Naval Flight Officer Training Requirements (NTR) until 2035. This subsystem assessment was based on the updated fleet aircraft usage spectrum and future predicted training missions of the T-45 aircraft. The assessment addressed all critical subsystems required and their ability to maintain IPP/NTR until 2035, analysis and studies will be conducted to outline improvements, assess manufacturing capabilities, prototype redesign and test of subsystems for trainer aircraft. The original funding within the T-45 SLAP budget programmed for T-45 tail hook has been absorbed into the overarching SLAP effort due to the success of T-45 additional tail hook life extension efforts.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** T-45 SLAP | 4.369 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Funding supports conducting a Subsystem SLAP to determine modifications necessary to extend service life through 2035. | | | | | |
| ***FY 2016 Accomplishments:***<br>Completed the Subsystem SLAP activities and engineering studies with the expectation of extending the T-45 service life to 2035. | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3182 / *T-45 SLAP* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.369 | 0.000 | 0.000 | 0.000 | 0.000 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • APN/05690: *T-45 Series OSIP 008-95/022-14* | 29.588 | 30.807 | 37.684 | - | 37.684 | 38.970 | 53.556 | 57.609 | 56.510 | 311.156 | 1,237.248 |

**Remarks**

Prior years were budgeted under OSIP 008-95 (totaling $553.901). Fiscal years 2014 and out are funded under OSIP 022-14.

**D. Acquisition Strategy**

The Subsystem Structural Service Life Assessment Program (SLAP) is a sole source contract effort with Boeing, the aircraft prime contractor. SLAP consists of an analysis of the aircraft subsystems (e.g., Global Positioning System Inertial Navigation Assembly or Mission Data Processor). The analysis will facilitate the future development of subsystem modifications and/or redesigns necessary to extend their life until 2035. The original funding within the T-45 SLAP budget programmed for T-45 tail hook has been absorbed into the overarching SLAP effort due to the alternate path success of T-45 tail hook life extension efforts.

**E. Performance Metrics**

SLAP provides an assessment of aircraft component life as affected by flight maneuver, catapults, arrestments, landings, and obsolescence based on actual usage and identifies the efforts required to extend the aircraft life to SLAP goals of 2035. Tools and modeling necessary to assess usage and life are developed, and specific designs, which do not meet SLAP goals are identified and analyzed. Retrofit concepts and redesigns for problem areas are developed, followed by the Service Life Extension Program during which the actual retrofits are undertaken.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0702207N / *Depot Maintenance (NON-IF)* | Project (Number/Name)<br>3384 / *MH-60 SLAP* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3384: *MH-60 SLAP* | 0.000 | 0.000 | 11.045 | 11.348 | - | 11.348 | 6.766 | 10.192 | 7.167 | 5.251 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

The MH-60 Service Life Assessment Program (SLAP) is assessing the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to extend the aircraft design life limits to allow it to meet Chief of Naval Operations (CNO) operational inventory requirements to bridge to a follow-on program procurement. The highest flight time MH-60S helicopters are expected to exceed the currently assumed design life limit of 10,000 flight hours in 2025, at which time as many as 30 aircraft per year could be downed without a SLAP and Service Life Extension Program (SLEP) established in FY 2018. The MH-60S has experienced significant structural issues since Initial Operational Capability in August 2002, resulting in downed aircraft and additional inspections for the operational fleet. Similar issues could very well precede the 10,000 flight hour life limit, particularly without the insight provided by a SLAP effort commenced as soon as possible. The goal of the MH-60S SLAP program is to identify critical structures, components, and subsystems that can achieve the extended service life limit goals. The initial efforts of the MH-60S SLAP is to assess the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to validate the currently assumed design life limit of 10,000 hours and potentially extend the aircraft life limit. The MH-60 SLAP is comprised of three distinct assessments: Fatigue Life Assessment (FLA),which will establish the fatigue life of the aircraft and air vehicle systems; Subsystem Life Assessment (SLA), which will determine subsystem components that are critical to safe flight and ground operations and identify safety risk and risk mitigation strategies for critical components; and the Dynamic Component Re-life Assessment (DRLA), which recalculates and establishes life limits for preselected MH-60 dynamic components. FLA consists of structural investigations of the cockpit beams, main gearbox beams/frames, upper deck, engine mount, lower tub, main landing gear, tail landing gear, cargo hook, transition splice and tie-down fittings/structure, tailcone, tail gearbox, intermediate gearbox, stabilator, manufactured joints/splices, and flight controls support structure. SLA will evaluate engine start and engine inlet anti-ice, rotor brake, hydraulic, flight controls, etc, to identify over-and-above inspections, overhaul intervals or replacement schedules to fly beyond the current design limit assumption. FY 2018 budget request funds the completion of external loads analysis, continuation of fatigue analysis, service life risk assessments of aircraft subsystems, and development of initial dispositions for safety critical items. This initial analysis, assessment and disposition will be further refined throughout the SLAP effort, augmented with specific system teardown, inspection and test, culminating in a follow-on Service Life Extension Program (SLEP), which will design and implement the solutions resulting from the SLAP findings.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** MH-60 SLAP | 0.000 | 11.045 | 11.348 | 0.000 | 11.348 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The current design life limits do not support United States Navy inventory requirements to bridge to a follow-on program procurement. Funding supports assessing the structural and subsystem condition of the MH-60S fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to bridge that gap. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3384 / *MH-60 SLAP* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***FY 2016 Accomplishments:***<br>N/A<br>***FY 2017 Plans:***<br>Collect aircraft historical regime and usage data for assessment, initiate airframe external loads analysis and fatigue analysis, and perform non-destructive tear-down examinations of two (2) aircraft and aircraft components. Perform analytical service life risk assessments of aircraft subsystems, develop initial dispositions for safety critical items.<br>***FY 2018 Base Plans:***<br>Continue to collect aircraft historical regime and usage data for assessment, continue airframe external loads analysis and fatigue analysis, and finish non-destructive tear-down examinations of two (2) aircraft and aircraft components. Continue analytical service life risk assessments of aircraft subsystems and continue to develop initial dispositions for safety critical items.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 11.045 | 11.348 | 0.000 | 11.348 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The Service Life Assessment Program (SLAP) program employs sole source contracts with Lockheed Martin, the aircraft prime manufacturer, in conjunction with government engineering and logistics expertise at Naval Air Station Patuxent River and in the H-60 Fleet Support Team at Cherry Point, NC. Analyses from the SLAP effort will provide the engineering data necessary to develop aircraft structural, component, and subsystem modifications to extend service life flight hour limits in order to avoid flight line inventory shortfalls. The MH-60S SLAP consists of two major engineering efforts: the aircraft structural assessment and the aircraft subsystems assessment. Both efforts are broken into multiple phases which develop tools and models, assess current aircraft usage, and develop concepts to extend aircraft life to meet Chief of Naval Operations objectives. The program will combine exploitation of complete aircraft teardown inspections and actual historical fleet usage. Conducting MH-60S SLAP to study the aircraft lifetime will define aircraft service life and is required to determine scope of the follow-on Service Life Extension Program (SLEP).

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3384 / *MH-60 SLAP* |

**E. Performance Metrics**

The MH-60 SLAP Fatigue Life Assessment (FLA) provides an assessment of aircraft structure fatigue life as affected by flight maneuver and Ground-Air-Ground cycles, based on Government furnished usage spectra and identifies the efforts required to extend the aircraft life to SLAP goals. During the FLA External Loads Analysis (FY 2017-2018), external loads for all fatigue conditions are identified from the three usage spectra. During the FLA (FY 2017-FY 2020), the fatigue assessment results and calculated fatigue lives are documented and areas for future improvements to extend the aircraft service life are identified. During the FLA Structural Analysis (FY 2019-FY 2021), static fail-safety analyses of specific airframe sites are conducted to substantiate continued safe flight and identify areas for future service life extensions. Subsystem SLAP Phase B is initiated concurrently with the FLA. During Subsystems SLAP Phase B (FY 2017-FY 2019), analytical service life risk assessments of aircraft subsystems are conducted and initial dispositions for safety-critical items are developed. During Subsystems SLAP Phase C (FY 2019-FY 2022), dispositions of Phase B are executed by performing component tests, aircraft inspections, and assembly teardowns. Additionally, SLAP assessments are continued on components needing further investigation, and SLEP dispositions are developed for safety critical components based on new data.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0702207N / *Depot Maintenance (NON-IF)* | Project (Number/Name)<br>3384 / *MH-60 SLAP* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fatigue Life Assessment MH-60S | SS/FFP | Sikorsky : Stratford, CT | 0.000 | 0.000 | | 6.125 | Apr 2017 | 4.190 | Apr 2018 | - | | 4.190 | Continuing | Continuing | Continuing |
| Subsystem Life Assessment MH-60S | SS/CPIF | Sikorsky : Stratford, CT | 0.000 | 0.000 | | 3.000 | Apr 2017 | 5.099 | Apr 2018 | - | | 5.099 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 9.125 | | 9.289 | | - | | 9.289 | - | - | - |

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SLAP MH-60S | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 1.238 | Apr 2017 | 1.052 | Dec 2017 | - | | 1.052 | Continuing | Continuing | Continuing |
| SLAP MH-60S | WR | FRC : Various | 0.000 | 0.000 | | 0.407 | Apr 2017 | 0.713 | Dec 2017 | - | | 0.713 | Continuing | Continuing | Continuing |
| Eng & Tech Srvc (Non FFRDC) | Various | Various : Various | 0.000 | 0.000 | | 0.101 | Apr 2017 | 0.103 | Dec 2017 | - | | 0.103 | 0.000 | 0.204 | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 1.746 | | 1.868 | | - | | 1.868 | - | - | - |

**Management Services ($ in Millions)**

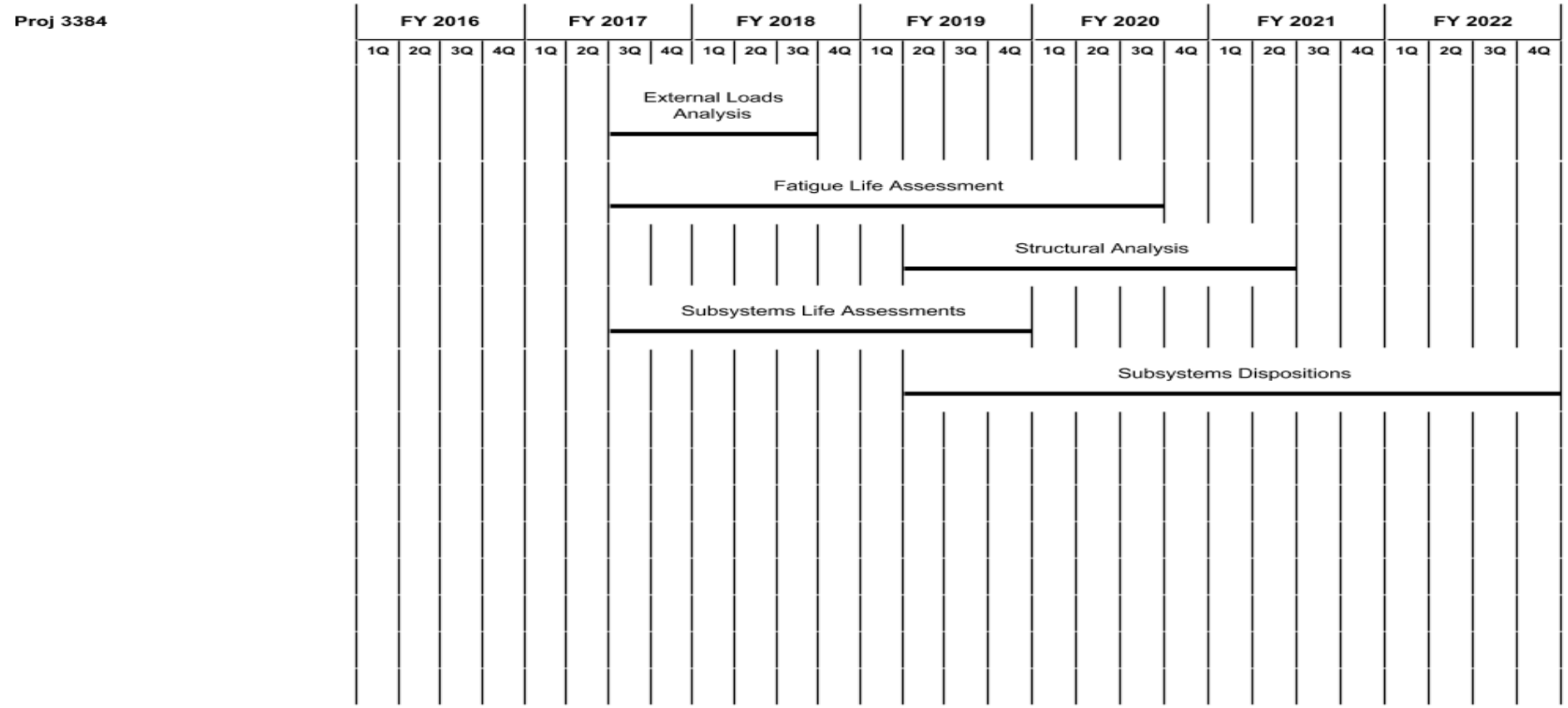
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technical Support SLAP MH-60S | WR | NAWCAD : Patuxent River, MD | 0.000 | 0.000 | | 0.055 | Apr 2017 | 0.070 | Dec 2017 | - | | 0.070 | Continuing | Continuing | Continuing |
| Mgmt Supt Services (Non FFRDC) | Various | Various : Various | 0.000 | 0.000 | | 0.101 | Apr 2017 | 0.103 | Dec 2017 | - | | 0.103 | 0.000 | 0.204 | - |
| Travel | Various | NAVAIR : Patuxent River, MD | 0.000 | 0.000 | | 0.018 | Apr 2017 | 0.018 | Oct 2017 | - | | 0.018 | 0.000 | 0.036 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.174 | | 0.191 | | - | | 0.191 | - | - | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0702207N / *Depot Maintenance (NON-IF)* | Project (Number/Name)<br>3384 / *MH-60 SLAP* | |

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 11.045 | | 11.348 | | - | | 11.348 | - | - | - |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3384 / *MH-60 SLAP* |




*2018PB - 0702207N - 3384*

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0702207N / *Depot Maintenance (NON-IF)* | **Project (Number/Name)**<br>3384 / *MH-60 SLAP* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 3384*** | | | | |
| External Loads Analysis | 3 | 2017 | 3 | 2018 |
| Fatigue Life Assessment | 3 | 2017 | 3 | 2020 |
| Structural Analysis | 2 | 2019 | 2 | 2021 |
| Subsystems Life Assessments | 3 | 2017 | 4 | 2019 |
| Subsystems Dispositions | 2 | 2019 | 4 | 2022 |

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 0708730N *I Maritime Tech (MARITECH)* |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Program Element | 17.349 | 4.162 | 3.204 | 4.808 | - | 4.808 | 4.373 | 3.900 | 4.567 | 4.659 | Continuing | Continuing |
| 2466: *NSRP ASE* | 17.349 | 4.162 | 3.204 | 4.808 | - | 4.808 | 4.373 | 3.900 | 4.567 | 4.659 | Continuing | Continuing |

**A. Mission Description and Budget Item Justification**

The National Shipbuilding Research Program (NSRP) is an industry and enterprise wide research collaboration that seeks to reduce the Navy's shipbuilding and repair cost. The resulting technologies implemented in NSRP-ASE member shipyards, benefit both the shipyard and the US Navy.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 4.321 | 3.204 | 4.861 | - | 4.861 |
| Current President's Budget | 4.162 | 3.204 | 4.808 | - | 4.808 |
| Total Adjustments | -0.159 | 0.000 | -0.053 | - | -0.053 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.159 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.019 | - | -0.019 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.034 | - | -0.034 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 0708730N / *Maritime Tech (MARITECH)* | Project (Number/Name)<br>2466 / *NSRP ASE* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2466: *NSRP ASE* | 17.349 | 4.162 | 3.204 | 4.808 | - | 4.808 | 4.373 | 3.900 | 4.567 | 4.659 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**A. Mission Description and Budget Item Justification**

NSRP ASE is a collaboration of U.S. shipyards working with the Navy customer to reduce the cost of building and repairing naval ships and improving shipbuilding industry productivity through advanced technology and processes. NSRP ASE is an innovative and proven approach to public/private cooperation to manage cost-shared R&D based on a national consensus Strategic Investment Plan. The Plan targets potential industry-wide technology and process solutions which are vetted by industry experts and builds upon the progress
made over the previous years. The collaboration's organizational structure promotes teaming of industry, government and academia to achieve the continuous product and process improvements necessary for improved Navy ship affordability. Solutions include both leverage of best commercial practices and creation of industry-wide initiatives with aggressive technology transfer to, and buy-in by, multiple U.S. shipyards. Navy PEOs (Ships, Subs and Carriers) and NAVSEA are directly involved in NSRP. The Plan calls for matching government and industry investments over several years.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Technology Development Projects | 4.162 | 3.204 | 4.808 | 0.000 | 4.808 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The NSRP is an ongoing Research and Development program. This program awards small research projects and large research projects to (1) Improve Quality; (2) Reduce Total Ownership Costs; and, (3) Increase Energy Efficiency. These research projects have been known to produce technological advances in shipbuilding that once implemented have resulted in savings for the Navy. | | | | | |
| ***FY 2016 Accomplishments:***<br>(1) Completed technology development projects in the four major initiative areas (Ship Design and Material Technologies, Ship Production Technologies, Business Process and Information Systems, and Infrastructure and Support (Regulatory Compliance, Technology Transfer and Workforce Development)) that were competitively selected by industry subject matter experts and Navy stakeholders during FY16, targeting the following priorities in Naval shipbuilding and repair:<br>(1) Improving Quality; (2) Reduction of Total Ownership Costs; and, (3) Increasing Energy Efficiency. The projects that were selected are focused in the following areas:<br>- Promotion of Modular Construction<br>- Reduction of Re-work<br>- Improving Production Engineering | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708730N / *Maritime Tech (MARITECH)* | **Project (Number/Name)**<br>2466 / *NSRP ASE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| - Improving Specifications and Standards<br>- Improving Manufacturing Processes<br>- Improving Production Planning<br>- Data Exchange<br>- Improving Safety & Health / Reducing Environmental Impacts<br>- Education and Training<br>- Total Ownership Cost<br>(2) Continued technology transfer among the Navy, shipbuilding industry, academia, equipment and material suppliers and the R&D community | | | | | |
| ***FY 2017 Plans:***<br>(1) Complete technology development projects in the four major initiative areas (Ship Design and Material Technologies, Ship Production Technologies, Business Process and Information Systems, and Infrastructure and Support (Regulatory Compliance, Technology Transfer and Workforce Development)) that will be competitively selected by industry subject matter experts and Navy stakeholders during GFY17, targeting the following priorities in Naval shipbuilding and repair:<br>(1) Improving Quality; (2) Reduction of Total Ownership Costs; and, (3) Increasing Energy Efficiency. It is anticipated that projects selected will continue to be focused in the following areas:<br>- Promotion of Modular Construction<br>- Reduction of Re-work<br>- Improving Production Engineering<br>- Improving Specifications and Standards<br>- Improving Manufacturing Processes<br>- Improving Production Planning<br>- Data Exchange<br>- Improving Safety & Health / Reducing Environmental Impacts<br>- Education and Training<br>- Total Ownership Cost<br>(2) Continue technology transfer among the Navy, shipbuilding industry, academia, equipment and material suppliers and the R&D community | | | | | |
| ***FY 2018 Base Plans:***<br>(1) Complete technology development projects in the four major initiative areas (Ship Design and Material Technologies, Ship Production Technologies, Business Process and Information Systems, and Infrastructure and Support (Regulatory Compliance, Technology Transfer and Workforce Development)) that will be | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 0708730N / *Maritime Tech (MARITECH)* | **Project (Number/Name)**<br>2466 / *NSRP ASE* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| competitively selected by industry subject matter experts and Navy stakeholders during GFY18, targeting the following priorities in Naval shipbuilding and repair:<br>(1) Improving Quality; (2) Reduction of Total Ownership Costs; and, (3) Increasing Energy Efficiency. It is anticipated that projects selected will continue to be focused in the following areas:<br>- Promotion of Modular Construction<br>- Reduction of Re-work<br>- Improving Production Engineering<br>- Improving Specifications and Standards<br>- Improving Manufacturing Processes<br>- Improving Production Planning<br>- Data Exchange<br>- Improving Safety & Health / Reducing Environmental Impacts<br>- Education and Training<br>- Total Ownership Cost<br>(2) Continue technology transfer among the Navy, shipbuilding industry, academia, equipment and material suppliers and the R&D community<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 4.162 | 3.204 | 4.808 | 0.000 | 4.808 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

R&D projects have been solicited and awarded by an industry collaboration represented by the Executive Control Board (ECB) of the National Shipbuilding Research Program (NSRP). The Navy has entered into an agreement with the industry collaboration using "other transaction" authority pursuant to 10 U.S.C. 2371.

**E. Performance Metrics**

Quarterly reports and reviews

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | R-1 Program Element (Number/Name)<br>PE 1203109N *I (U)Satellite Communications (SPACE)* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 0.000 | 0.000 | 0.000 | 37.836 | - | 37.836 | 35.724 | 48.023 | 49.800 | 55.015 | Continuing | Continuing |
| 0728: *EHF SATCOM Terminals* | 0.000 | 0.000 | 0.000 | 22.361 | - | 22.361 | 19.144 | 33.051 | 34.509 | 40.709 | Continuing | Continuing |
| 2472: *Mobile User Objective Sys (MUOS)* | 0.000 | 0.000 | 0.000 | 13.965 | - | 13.965 | 15.654 | 14.972 | 15.291 | 14.306 | 46.060 | 120.248 |
| 3398: *Enterprise SATCOM Gateway Modems (ESGMs)* | 0.000 | 0.000 | 0.000 | 1.510 | - | 1.510 | 0.926 | 0.000 | 0.000 | 0.000 | 0.000 | 2.436 |
| **Program MDAP/MAIS Code:**<br>**Project MDAP/MAIS Code(s):** 290, 345 | | | | | | | | | | | | |

**A. Mission Description and Budget Item Justification**

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of A2AD initiatives. The NMT system replenishes and improves on Navy terminal capabilities of the Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS) and Global Broadcast Service (GBS). The new system equips the warfighters with the assured, jam resistant, secure communications as described in the joint AEHF satellite communications system and WGS Operational Requirements Documents (ORD). The NMT provides multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) ACAT IC program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The Joint GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement in place of the Joint Internet. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. GBS augments and interfaces with other communications systems, provides relief to overburdened communications systems already in place, and provides information to previously unsupported users. GBS provides bandwidth five times any other system, up to 45 Mbps of forward link data (shore to ship) per WGS satellite transponder.

The Mobile User Objective System (MUOS) program provides for the development of the next generation Department of Defense (DoD) advanced narrowband communications satellite constellation. MUOS is the only UHF satellite system replacing the aging UHF Follow-on (UFO) system, which is currently beyond its design

| Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy | Date: May 2017 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | **R-1 Program Element (Number/Name)**<br>PE 1203109N *I (U)Satellite Communications (SPACE)* |

life. MUOS provides legacy UHF satellite communications as well as a Wideband Code Division Multiple Access (WCDMA) capability which significantly increases performance and capacity critical to support Combatant Command priorities.

Beginning in FY18, the Satellite Communications (Space) funding profiles have moved to PE 1203109N from PE 0303109N.

| B. Program Change Summary ($ in Millions) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 0.000 | 0.000 | 0.000 | - | 0.000 |
| Current President's Budget | 0.000 | 0.000 | 37.836 | - | 37.836 |
| Total Adjustments | 0.000 | 0.000 | 37.836 | - | 37.836 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Program Adjustments | 0.000 | 0.000 | 37.478 | - | 37.478 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.358 | - | 0.358 |

**Change Summary Explanation**

Projects 0728, 2472 and 3398 were realigned from PE 0303109N FY2018-FY2022

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | Project (Number/Name)<br>0728 / *EHF SATCOM Terminals* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0728: *EHF SATCOM Terminals* | 0.000 | 0.000 | 0.000 | 22.361 | - | 22.361 | 19.144 | 33.051 | 34.509 | 40.709 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 290

**Note**

NMT FY18-FY22 funding profile has moved from PE 0303109N to 1203109N.

**A. Mission Description and Budget Item Justification**

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas, and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system replenishes and improves on Navy Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS), and Global Broadcast Service (GBS) terminal capabilities. The new system equips the warfighters with assured, jam resistant, secure communications as described in both the joint AEHF Satellite Communications System and the WGS Operational Requirement Documents (ORD). Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the ORD. The NMT provides multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Wideband Anti-Jam Modem Systems (WAMS) enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). The United States Air Force (USAF) Protected Tactical Enterprise Service (PTES) program will provide the ground hub component of the WAMS communication system. This PTES joint hub will serve as a DoD enterprise service ground solution for the use of the Protected Tactical Waveform (PTW) of SATCOM communications. WAMS enables space segment AJ diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. WAMS will also include a Mini-Hub component to be fielded on all Force Level platforms to provide operations in the event Shore Communications are eliminated. WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications in the A2AD environment. The use of WAMS Protected Tactical Waveform (PTW) on WGS will augment AEHF extended data rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially in an Anti-Access Area Denial (A2AD) satellite denied environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity within the High Capacity Backbone (HCB) Common Data Link (CDL) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document and the JALN Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) NMT waveform for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and intend to develop a pre-planned product improvement to leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. A critical component of A2AD

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

is Adaptive Coding (AC) software development incorporation into the baseline NMT terminal including the Advanced Time Division Multiple Access (TDMA) Interface Processor (ATIP) in addition to supporting the JALN-M demonstration. This capability autonomously enhances maximum throughput and supports degraded conditions by adjusting End-to-End code rate to provide continuous, mission critical, and protected communications.

Technology Insertion, studies and implementation is necessary for military satellite communications systems development to support emerging technologies for Commercial Broadband Satellite Program (CBSP) and Global Broadcast Service (GBS) Terminals. Efforts will include evaluation of End-to-End performance testing of data rates associated with Broadband and Broadcast transmissions.

FY18 NMT activities will continue the development of WAMS technical baseline into NMT to include requirements and design changes to improve performance when operating with WAMS. Efforts will include integration strategies with DoD enterprise Protected Tactical Enterprise Service (PTES) ground solution architecture as well as WAMS specification documentation development. Efforts will continue Adaptive Coding (AC) software design development for Time of Day (TOD) encryption and begin software design development efforts to implement robust AC capability.

FY18 JALN-M efforts will focus on completion of integration and testing of NMT and ATIP pre-demonstration flights and testing with Aerial Extended Data Rate (AXDR) payload to support JALN-M demonstration flight tests. The demonstration will include Navy ship-to-ship/sub and ship/afloat-to-GIG communications via Airborne JALN-M Pod hosting AXDR, High Capacity Backbone (HCB), and Assured PNT (Positioning, Navigation, and Timing) payloads. Results of the demonstration seeks to inform DoD and Navy leadership on the JALN way ahead (technical and programmatic risks) and of the viability of JALN-M as a future capability.

FY18 Technology Insertion will support various testing efforts for Commercial Broadband Satellite Program (CBSP) to evaluate End to End Performance of data rates throughout the shipboard network.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** NMT Development | 0.000 | 0.000 | 20.154 | 0.000 | 20.154 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** The NMT development efforts support Anti-Access/Area Denial A2AD capabilities. Those capabilities provide secure SATCOM access in contested/degraded environments by providing anti jam and improved bandwidth that supports increasing Fleet demands. WAMS will provide an anti-jamming capability that will counter various adversary threats and Adaptive Coding (AC) will autonomously maximize throughput in degraded or benign conditions. Efforts include NMT modifications to support new software and hardware development to enable these A2AD capabilities. | | | | | |
| ***FY 2016 Accomplishments:***<br>NMT Development FY16 funding profile resides in PE 0303109N. | | | | | |
| ***FY 2017 Plans:***<br>NMT Development FY17 funding profile resides in PE 0303109N. | | | | | |
| ***FY 2018 Base Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| Begin major Time of Day (TOD) software design development efforts on the affected three different systems to include NMT, ATIP, and KIV-7M to implement the more robust AC capability. The multiple vendors for NMT, ATIP, and KIV-7M will work parallel Engineering Change Proposals (ECPs) to design and ensure interoperability on development efforts for Adaptive Coding software TOD encryption to enable a more robust, lower code rate when the link margin is degraded. This will ensure ADNS/ATIP interface data rates changes commensurate with code rate changes are optimized to ensure maximum user data throughput. The program will undertake NSA certification of AC TOD encryption. These modifications will allow the ATIP to support TOD for KIV-7M use to prevent crypto losing synchronization during degraded link environment. Start the development of integration and testing plans for the TOD encryption solution and perform technical and system risk reduction.<br><br>NMT will be conducting Operational Test-E1 to evaluate the operational effectiveness and operational suitability of the Enhanced Polar System (EPS) modified NMT which utilizes the protected high frequency (EHF) satellite communications in the North Polar. In addition, NMT will support Air Force Lead Developmental Test Organization (LDTO) EPS events and EPS Multi-Service Operational Test and Evaluation (MOT&E).<br><br>Continue development of the WAMS technical baseline for use in NMT and complete Systems Engineering Technical Review (SETR) activities. Develop requirements and NMT specification changes and commence NMT design changes to improve performance when operating with the WAMS. Develop design of the Modem Mission Management System (MMS) and Key Management System (KMS) as well as integration strategies for MMS/KMS operational compatibility with DoD enterprise Protected Tactical Enterprise Service (PTES) (which is the Air Force ground system for waveform operations over the Wideband Global SATCOM (WGS) ground solution architecture. Obtain and certify space assets and ground facilities to support testing and assessment of EDM modems. Develop test plans and procedures and begin Navy testing of USAF EDM modems. Testing will include analysis of three separate vendor EDM designs procured from the USAF Protected Tactical Field Service Demonstration (PTSFD) effort. The testing process will verify and validate the vendor designs ensuring that Navy unique performance (antenna handover) and environmental (shock, vibration, temperature, and humidity) requirements are addressed in the design. Further refinement of technical and pre-award acquisition documentation for the Modem and Mini-Hub contracts of the WAMS effort including RFP development and coordination as well as technical specifications. Initiate modem certification and coordination process through NSA. Documentation development will include the WAMS Specification, WAM Mini-Hub specification, Cyber strategy to support the Clinger Cohen Act and Information Support Plan (ISP).<br><br>***FY 2018 OCO Plans:*** | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| ***Title:*** Joint Aerial Layer Network Maritime (JALN-M)<br>***Articles:***<br><br>***FY 2016 Accomplishments:***<br>NMT Development FY16 funding profile resides in PE 0303109N.<br><br>***FY 2017 Plans:***<br>NMT Development FY17 funding profile resides in PE 0303109N.<br><br>***FY 2018 Base Plans:***<br>Complete system of systems integration and testing of NMT and ATIP Adaptive Coding during pre-demonstration flights. This includes completion of design verification of JALN-M capabilities of NMT by testing with the Airborne XDR payload. Perform systems engineering, test support and document analytical data and findings. Complete installation of the JALN-M capabilities and execute shipboard/site verification by using the AEHF satellite for End-to-End SATCOM Adaptive Coding.<br><br>***FY 2018 OCO Plans:***<br>N/A | 0.000<br>- | 0.000<br>- | 2.107<br>- | 0.000<br>- | 2.107<br>- |
| ***Title:*** Technology Insertion<br>***Articles:***<br><br>***Description:*** Overall program efforts include technology insertion implementation and associated testing required to support satellite communications.<br><br>***FY 2016 Accomplishments:***<br>N/A<br><br>***FY 2017 Plans:***<br>Technology Insertion FY17 funding profile resides in PE 0303109N.<br><br>***FY 2018 Base Plans:***<br>Perform Development Test (DT), Operational Test (OT) and Operational Test Readiness Review (OTRR) of Commercial Broadband Satellite Program (CBSP) Force Level Variant (FLV) Capacity Key Performance Parameter (KPP) to evaluate End-to-End performance of data rates throughout the shipboard network.<br><br>***FY 2018 OCO Plans:*** | 0.000<br>- | 0.000<br>- | 0.100<br>- | 0.000<br>- | 0.100<br>- |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 22.361 | 0.000 | 22.361 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • 1203109N/3216: *NAVY MULTIBAND TERMINAL (NMT)* | 118.142 | 38.365 | 69.764 | - | 69.764 | 99.741 | 98.101 | 22.528 | 14.462 | 69.688 | 1,383.810 |

**Remarks**

D. The NMT Follow-On Full Deployment (FOFD) contract continues NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and allows the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to COMTECH supports the development of Anti-Access Area Denial (A2AD).

**D. Acquisition Strategy**

The NMT Follow-On Full Deployment (FOFD) contract will continue NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and will allow the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to COMTECH supports the development of Anti-Access Area Denial (A2AD).

**E. Performance Metrics**

The RDT&E goal for the NMT program is to create a military satellite communications system that consolidates capabilities of current and future satellite systems into a single terminal. SATCOM-related technology insertion, studies and associated testing will support the CBSP Program.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Development JALN-M | C/CPAF | RAYTHEON : Marlborough, MA | 0.000 | 0.000 | | 0.000 | | 0.000 | Dec 2017 | - | | 0.000 | 0.000 | 0.000 | - |
| Software Development Time of Day (TOD) | C/CPAF | RAYTHEON : Marlborough, MA | 0.000 | 0.000 | | 0.000 | | 9.312 | Dec 2017 | - | | 9.312 | Continuing | Continuing | Continuing |
| Software Development ATIP Adaptive Coding (AC) /Time of Day (TOD) | C/CPFF | COMTECH : Tempe, AZ | 0.000 | 0.000 | | 0.000 | | 1.657 | Dec 2017 | - | | 1.657 | Continuing | Continuing | Continuing |
| Systems Engineering | C/CPFF | NUWC : Newport, RI | 0.000 | 0.000 | | 0.000 | | 3.857 | Jan 2018 | - | | 3.857 | Continuing | Continuing | Continuing |
| Systems Engineering | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 1.381 | Jan 2018 | - | | 1.381 | 0.000 | 1.381 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 16.207 | | - | | 16.207 | - | - | - |

**Remarks**

FY17 initiated studies for the Adaptive Coding Time of Day effort. FY18 NMT Product Development focuses on the complexity of software design development across systems and vendors to support Adaptive Coding Time of Day (TOD) Encryption. Additionally the program will be performing NMT testing with Enhanced Polar Systems (EPS) and will initiate testing of the PTSFD EDM modems. Funding moved from PE 0303109N to 1203109N starting in FY18.

**Support ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Software Integration/ Government Oversight | WR | NUWC : Newport, RI | 0.000 | 0.000 | | 0.000 | | 1.654 | Nov 2017 | - | | 1.654 | Continuing | Continuing | Continuing |
| Software Integration Support | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.572 | Nov 2017 | - | | 0.572 | Continuing | Continuing | Continuing |
| Software Engineering Support | C/CPFF | SYSTECH : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.673 | Nov 2017 | - | | 0.673 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 2.899 | | - | | 2.899 | - | - | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | Project (Number/Name)<br>0728 / *EHF SATCOM Terminals* | |

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPS & JALN-M Development Test and Evaluation | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 1.632 | Nov 2017 | - | | 1.632 | Continuing | Continuing | Continuing |
| Operational Test & Evaluation | WR | COMOPTEVFOR : Norfolk, VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 1.632 | | - | | 1.632 | - | - | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contract Management | C/CPFF | BAH : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 0.204 | Nov 2017 | - | | 0.204 | Continuing | Continuing | Continuing |
| Program Management | C/CPFF | BAH : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 1.369 | Nov 2017 | - | | 1.369 | Continuing | Continuing | Continuing |
| Travel | Various | SPAWAR : Various | 0.000 | 0.000 | | 0.000 | | 0.050 | Nov 2017 | - | | 0.050 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 1.623 | | - | | 1.623 | - | - | - |

**Remarks**

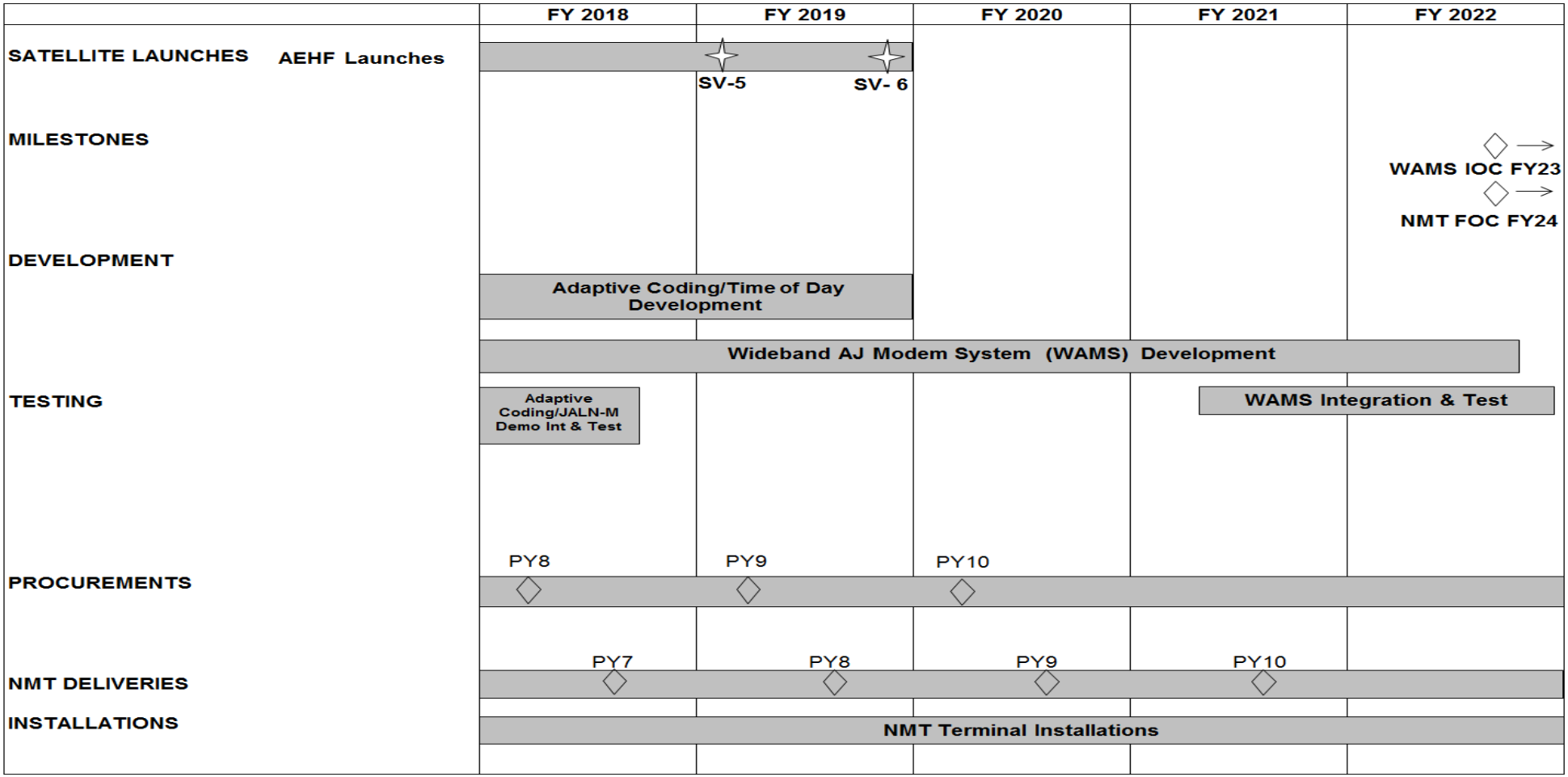
Funding moved from PE 0303109N to 1203109N starting in FY18.

| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 22.361 | | - | | 22.361 | - | - | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |




Note: FY16 and FY17 NMT funding profile resides in PE 0303109N.

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>0728 / *EHF SATCOM Terminals* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 0728*** | | | | |
| AEHF Launch SV-5 | 1 | 2019 | 1 | 2019 |
| A2AD Adaptive Coding & JALN-M Integration & Testing | 1 | 2018 | 3 | 2018 |
| A2AD Wideband AJ Modem Development | 1 | 2018 | 3 | 2022 |
| Procurement Year (PY8) | 2 | 2018 | 2 | 2018 |
| Procurement Year (PY9) | 2 | 2019 | 2 | 2019 |
| Procurement Year (PY10) | 2 | 2020 | 2 | 2020 |
| FRP PY7 Delivery | 3 | 2018 | 3 | 2018 |
| FRP PY8 Delivery | 3 | 2019 | 3 | 2019 |
| FRP PY9 Delivery | 3 | 2020 | 3 | 2020 |
| WAM Integration & Testing | 2 | 2021 | 4 | 2022 |
| FRP PY10 Delivery | 3 | 2021 | 3 | 2021 |
| AEHF Launch SV-6 | 4 | 2019 | 4 | 2019 |
| A2AD Adaptive Coding/Time of Day | 1 | 2018 | 4 | 2019 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | | | | | | | | | Date: May 2017 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | | | | | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | | | | Project (Number/Name)<br>2472 / *Mobile User Objective Sys (MUOS)* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2016** | **FY 2017** | **FY 2018 Base** | **FY 2018 OCO** | **FY 2018 Total** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **Cost To Complete** | **Total Cost** |
| 2472: *Mobile User Objective Sys (MUOS)* | 0.000 | 0.000 | 0.000 | 13.965 | - | 13.965 | 15.654 | 14.972 | 15.291 | 14.306 | 46.060 | 120.248 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Project MDAP/MAIS Code:** 345

**Note**

Project 2472 was realigned from PE 0303109N FY2018-FY2022

**A. Mission Description and Budget Item Justification**

The Mobile User Objective System (MUOS) provides a worldwide, multi-service population of mobile and fixed-site terminal users with Ultra-High Frequency (UHF), narrowband, beyond line of sight satellite communications (SATCOM). MUOS significantly increases performance and capacity in support of critical Combatant Command SATCOM priorities. MUOS is the replacement system for the UHF Follow-on (UFO) system, which is currently beyond its design life. MUOS consists of Space, Ground, and User Entry Segments. The Space Segment consists of 5 geosynchronous satellites, one which is an on-orbit spare, and provides both a legacy UHF payload, which is backward compatible with UFO, and a Wideband Code Division Multiple Access (WCDMA) payload, which provides 3G cellular-like capability. The Ground Segment consists of four world-wide Radio Access Facilities (RAFs) and two satellite control facilities. Each RAF includes three 60 ft. antennas, and numerous racks of equipment. The RAF in Hawaii includes a Network Management Facility (NMF). The RAFs in Hawaii and Virginia each include a Switching Facility (SF). The User Entry Segment consists of the MUOS waveform that is ultimately integrated into MUOS-capable terminals. The MUOS legacy capability has been in operational use since 2012, and the WCDMA capability transitioned to Early Combatant Command Use in July 2016.

In addition to providing UHF SATCOM for the Department of Defense (DoD), the Navy has the overall responsibility to deliver the End-to-End (E2E) MUOS capability to the warfighter. This responsibility involves systems engineering, integration, and test management of all MUOS system of system activities, to include the integration of the MUOS waveform into MUOS-capable terminals and the subsequent terminal certification testing.

In June 2016 based on the results of the Multi-Service Operational Test and Evaluation-2 (MOT&E-2), Director, Operational Test & Evaluation (DOT&E) assessed MUOS not operationally effective or suitable. As a result of the program addressing findings and preparing for MOT&E-2B in FY19, Full Operational Capability (FOC) has been moved to FY20.

The budget line in FY18 and out is dedicated to completion of the MOT&E-2B activities, system optimization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates, and testing to support certification of MUOS-capable terminals.

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Mobile User Objective Sys (MUOS) | 0.000 | 0.000 | 13.965 | 0.000 | 13.965 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>N/A | | | | | |
| ***FY 2018 Base Plans:***<br>Support integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals in support of the U.S. Army Handheld, Manpack, and Small Form Fit (HMS) terminal program. Address operational test deficiencies and prepare for FY19 Multi-service Operational Test and Evaluation-2B (MOT&E-2B) activities, particularly addressing the capability to monitor system status and provide situational awareness for the system operators. Execute 5 developmental test assist events in preparation for FY19 MOT&E-2B. Address emerging cybersecurity requirements. Develop a modernized geolocation Ground Segment subsystem in order to meet baseline requirements. Address the dynamic, worldwide electronic magnetic environment through system optimization to ensure capacity is available to the end user. | | | | | |
| ***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 13.965 | 0.000 | 13.965 |

**C. Other Program Funding Summary ($ in Millions)**

| Line Item | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • WPN/2433: *Fleet Satellite Comm Follow-On* | 35.961 | 36.723 | 46.357 | - | 46.357 | 68.018 | 70.225 | 55.935 | 48.248 | 328.733 | 2,721.265 |

**Remarks**

**D. Acquisition Strategy**

Currently sustainment and engineering activities are procured via the baseline MUOS Risk Reduction and Design Development contract. The program is working to transition these activities to dedicated sustainment contracts for the Ground/User Entry and Space Segments. Integration of the MUOS waveform into MUOS-capable

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

terminals and execution of certification testing of MUOS-capable terminals are executed primarily by the Navy Working Capital Funded SPAWAR Systems Center Pacific.

**E. Performance Metrics**

MUOS Goal: Achieve Full Operational Capability in FY 2020.

Metric: Successfully complete 5 developmental test assist events in FY18, and Multi-Service Operational Test and Evaluation-2B FY19.

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | Project (Number/Name)<br>2472 / *Mobile User Objective Sys (MUOS)* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Contract | C/CPAF | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 7.700 | Oct 2017 | - | | 7.700 | 0.000 | 7.700 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 7.700 | | - | | 7.700 | 0.000 | 7.700 | - |

**Remarks**

Increase of ~$600K in Engineering Contract (RRDD AOS Contract) from FY17 to FY18 due to increased efforts to address Operational Test deficiencies.
Funding moved from PE 0303109N to 1203109N starting in FY18.

**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Developmental Test & Evaluation | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 1.515 | Oct 2017 | - | | 1.515 | 0.000 | 1.515 | - |
| Operational Test & Evaluation | WR | COTF : Norfolk, VA | 0.000 | 0.000 | | 0.000 | | 0.250 | Oct 2017 | - | | 0.250 | 0.000 | 0.250 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 1.765 | | - | | 1.765 | 0.000 | 1.765 | - |

**Remarks**

Increase of $1.765M in Test and Evaluation efforts from FY17 to FY18 due to Test Assist Events in preparation for MOT&E-2B.
Funding moved from PE 0303109N to 1203109N starting in FY18.

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contractor Engineering Support | Various | Various : Various | 0.000 | 0.000 | | 0.000 | | 3.000 | Oct 2017 | - | | 3.000 | 0.000 | 3.000 | - |
| Government Engineering | WR | SSC PAC : San Diego, CA | 0.000 | 0.000 | | 0.000 | | 1.500 | Oct 2017 | - | | 1.500 | 0.000 | 1.500 | - |
| | | **Subtotal** | 0.000 | 0.000 | | 0.000 | | 4.500 | | - | | 4.500 | 0.000 | 4.500 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | Project (Number/Name)<br>2472 / *Mobile User Objective Sys (MUOS)* | |

**Management Services ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2016 Cost | FY 2016 Award Date | FY 2017 Cost | FY 2017 Award Date | FY 2018 Base Cost | FY 2018 Base Award Date | FY 2018 OCO Cost | FY 2018 OCO Award Date | FY 2018 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Remarks** | | | | | | | | | | | | | | | |
| Funding moved from PE 0303109N to 1203109N starting in FY18. | | | | | | | | | | | | | | | |

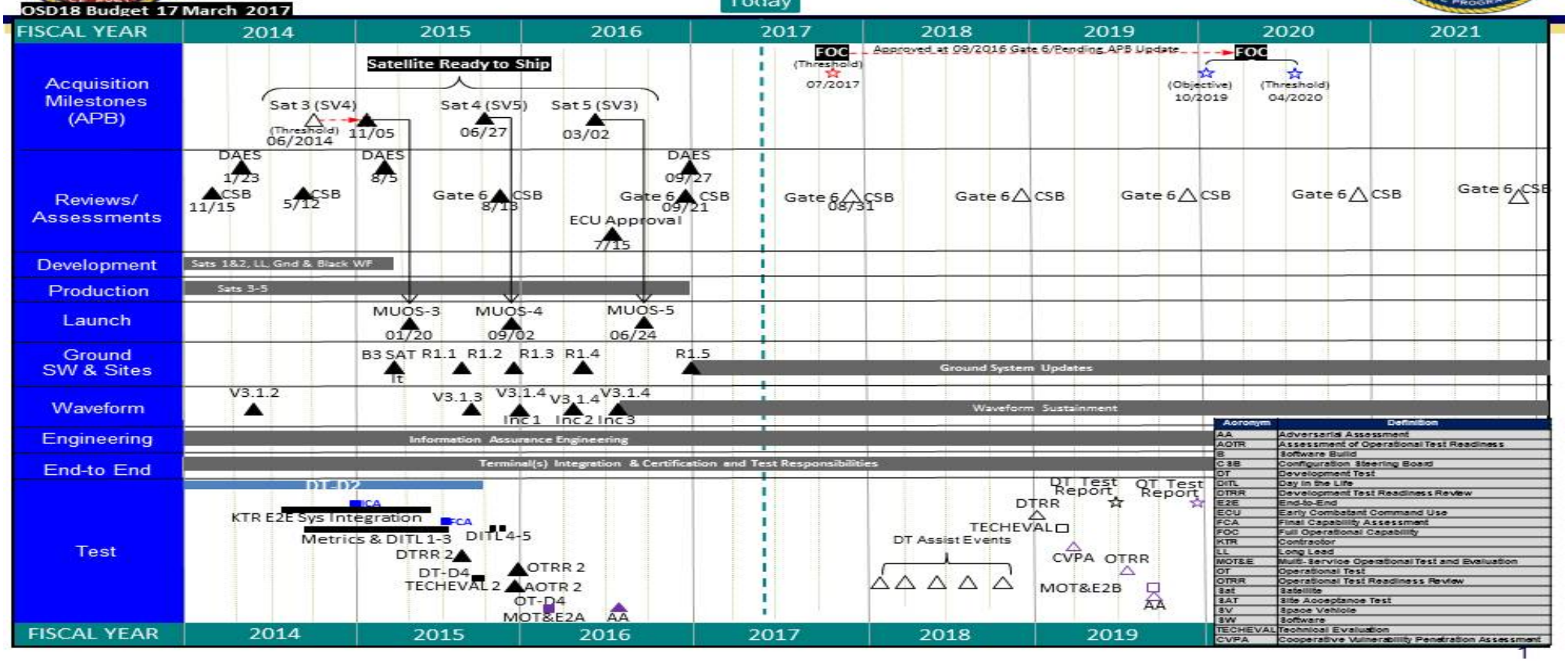
| | Prior Years | FY 2016 | | FY 2017 | | FY 2018 Base | | FY 2018 OCO | | FY 2018 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 0.000 | 0.000 | | 0.000 | | 13.965 | | - | | 13.965 | 0.000 | 13.965 | - |

**Remarks**

Funding moved from PE 0303109N to 1203109N starting in FY18.

| Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

# MUOS Program Schedule




| Acronym | Definition |
|---|---|
| AA | Adversarial Assessment |
| AOTR | Assessment of Operational Test Readiness |
| B | Software Build |
| CBB | Configuration Steering Board |
| DT | Development Test |
| DITL | Day in the Life |
| DTRR | Development Test Readiness Review |
| E2E | End-to-End |
| ECU | Early Combatant Command Use |
| FCA | Final Capability Assessment |
| FOC | Full Operational Capability |
| KTR | Contractor |
| LL | Long Lead |
| MOT&E | Multi-Service Operational Test and Evaluation |
| OT | Operational Test |
| OTRR | Operational Test Readiness Review |
| Sat | Satellite |
| SAT | Site Acceptance Test |
| SV | Space Vehicle |
| SW | Software |
| TECHEVAL | Technical Evaluation |
| CVPA | Cooperative Vulnerability Penetration Assessment |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2472*** | | | | |
| Information Assurance Engineering | 1 | 2018 | 4 | 2021 |
| Terminal Integration, Certification, and Test | 1 | 2018 | 4 | 2021 |
| Waveform Sustainment | 1 | 2018 | 4 | 2021 |
| Ground System Updates | 1 | 2018 | 4 | 2021 |
| Developmental Test Assist Event 1 | 1 | 2018 | 1 | 2018 |
| Developmental Test Assist Event 2 | 2 | 2018 | 2 | 2018 |
| Developmental Test Assist Event 3 | 2 | 2018 | 2 | 2018 |
| Developmental Test Assist Event 4 | 3 | 2018 | 3 | 2018 |
| Developmental Test Assist Event 5 | 4 | 2018 | 4 | 2018 |
| Gate 6/CSB FY18 | 4 | 2018 | 4 | 2018 |
| Developmental Test Readiness Review | 1 | 2019 | 1 | 2019 |
| Tech Eval | 1 | 2019 | 1 | 2019 |
| DT Test Report | 2 | 2019 | 2 | 2019 |
| OT Readiness Review | 3 | 2019 | 3 | 2019 |
| MOT&E2B | 3 | 2019 | 3 | 2019 |
| Adversarial Assessment | 3 | 2019 | 3 | 2019 |
| OT Test Report | 4 | 2019 | 4 | 2019 |
| Gate 6/CSB FY19 | 4 | 2019 | 4 | 2019 |
| Full Operational Capability (FOC) Objective | 1 | 2020 | 1 | 2020 |
| Full Operational Capability (FOC) Threshold | 3 | 2020 | 3 | 2020 |
| Gate 6/CSB FY20 | 4 | 2020 | 4 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>2472 / *Mobile User Objective Sys (MUOS)* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Gate 6/CSB FY21 | 4 | 2021 | 4 | 2021 |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | | Date: May 2017 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 7 | R-1 Program Element (Number/Name)<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | Project (Number/Name)<br>3398 / *Enterprise SATCOM Gateway Modems (ESGMs)* | |

| COST ($ in Millions) | Prior Years | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total | FY 2019 | FY 2020 | FY 2021 | FY 2022 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3398: *Enterprise SATCOM Gateway Modems (ESGMs)* | 0.000 | 0.000 | 0.000 | 1.510 | - | 1.510 | 0.926 | 0.000 | 0.000 | 0.000 | 0.000 | 2.436 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

**Note**

ESGM's FY18-FY19 funding profile has moved from PE 0303109N to 1203109N.

**A. Mission Description and Budget Item Justification**

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. GBS provides Satellite Communications (SATCOM) capability for forces afloat, ashore, and Naval Special Warfare Command.

The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement. This modem will replace the existing modem in the GBS System. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. Additionally, the ESGM will continue to enable GBS reception of the Digital Video Broadcast - Satellite 2nd Generation (DVB-S2).

FY18 GBS activities will complete integration and testing for the Enterprise Satellite Communications Gateway Modems (ESGM) technical baseline.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| ***Title:*** Enterprise SATCOM Gateway Modems (ESGMs) | 0.000 | 0.000 | 1.510 | 0.000 | 1.510 |
| ***Articles:*** | - | - | - | - | - |
| ***FY 2016 Accomplishments:***<br>N/A | | | | | |
| ***FY 2017 Plans:***<br>Enterprise SATCOM Gateway Modems (ESGMs)FY17 funding profile has moved to PE 0303109N. | | | | | |
| ***FY 2018 Base Plans:***<br>Complete integration and testing necessary to support the Enterprise Satellite Communications Gateway Modems (ESGM) technical baseline. Complete test execution, qualification and reporting for Navy-specific | | | | | |

| Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy | | Date: May 2017 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 7 | **R-1 Program Element (Number/Name)**<br>PE 1203109N / *(U)Satellite Communications (SPACE)* | **Project (Number/Name)**<br>3398 / *Enterprise SATCOM Gateway Modems (ESGMs)* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2016 | FY 2017 | FY 2018 Base | FY 2018 OCO | FY 2018 Total |
|---|---|---|---|---|---|
| requirements. GBS Joint ESGM DT and OT activities. Complete application integration testing and report on compliance with Navy C4I systems.<br>***FY 2018 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.000 | 0.000 | 1.510 | 0.000 | 1.510 |

**C. Other Program Funding Summary ($ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

The GBS program reached a Full Rate Production Decision on 24 Oct 2008 and is in sustainment. The Enterprise Satellite Communications (SATCOM) Gateway Modem (ESGM), the Commercial Off-The-Shelf (COTS) Internet Protocol (IP) modem, provides Transmission Security functionality in support of DoD CIO direction to implement Information Assurance for all transmission media.

**E. Performance Metrics**

The RDT&E goal for the GBS program is to create a military satellite communications system that supports current and future requirements for Anti-Access/Area Denial and Information Assurance.

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