| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy | | | | | | | | | | | Date: February 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)* | | | | | R-1 Program Element (Number/Name)<br>PE 0604311N *I LPD-17 Class Systems Integration* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 33.536 | 0.565 | 0.689 | 0.939 | - | 0.939 | 0.863 | 0.811 | 0.827 | 0.844 | Continuing | Continuing |
| 2283: *LPD-17 Class System Integration* | 33.536 | 0.565 | 0.689 | 0.939 | - | 0.939 | 0.863 | 0.811 | 0.827 | 0.844 | Continuing | Continuing |

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

The FY 2019 funding request was reduced by $0.018 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

The LPD 17 Class ships are functional replacements for 41 ships of four classes of amphibious ships. These new ships embark, transport, and land elements of Marine landing forces in an assault by helicopters, landing craft, and amphibious vehicles. Tactics, techniques, and tools for naval expeditionary warfare continue to evolve. The LPD 17 Class configuration must continue to adapt to this evolutionary process, because these ships are expected to be in service until almost 2050. The LPD 17 design includes system configurations that reduce operating and support costs and facilitate operational performance improvements. System engineering and integration efforts that began in FY97 will develop further reductions in life cycle costs and will integrate performance upgrades in a rapid, affordable manner. Possible research and development investigations include improvements in Hull, Mechanical and Electrical systems, advanced sensors, advanced computers, advanced command and control software, advanced information system technologies, and ship based logistics support. Cost reduction and improved performance will be accomplished through sustained modeling and simulation efforts, resolutions of equipment obsolescence issues, prototype development, continued personnel reduction efforts, system performance tradeoff evaluations, and naval expeditionary warfare system engineering. Feedback from the Fleet for integrating system configurations will be accomplished through Naval Surface Warfare Centers (Philadelphia, Dahlgren, Port Hueneme, Panama City). These efforts will result in well defined specifications and drawings in system in system integration design packages that provide technical baseline for follow on ship procurements.

| **B. Program Change Summary ($ in Millions)** | **FY 2017** | **FY 2018** | **FY 2019 Base** | **FY 2019 OCO** | **FY 2019 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 0.580 | 0.689 | 0.968 | - | 0.968 |
| Current President's Budget | 0.565 | 0.689 | 0.939 | - | 0.939 |
| Total Adjustments | -0.015 | 0.000 | -0.029 | - | -0.029 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.015 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -0.018 | - | -0.018 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.011 | - | -0.011 |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604311N / *LPD-17 Class Systems Integration* | Project (Number/Name)<br>2283 / *LPD-17 Class System Integration* | |

| COST ($ in Millions) | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2283: *LPD-17 Class System Integration* | 33.536 | 0.565 | 0.689 | 0.939 | - | 0.939 | 0.863 | 0.811 | 0.827 | 0.844 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

The LPD 17 Class ships are functional replacements for 41 ships of four classes of amphibious ships. These new ships embark, transport, and land elements of Marine landing forces in an assault by helicopters, landing craft, and amphibious vehicles. Tactics, techniques, and tools for naval expeditionary warfare continue to evolve. The LPD 17 Class configuration must continue to adapt to this evolutionary process, because these ships are expected to be in service until almost 2050. The LPD 17 design includes system configurations that reduce operating and support costs and facilitate operational performance improvements. System engineering and integration efforts that began in FY97 will develop further reductions in life cycle costs and will integrate performance upgrades in a rapid, affordable manner. Possible research and development investigations include improvements in Hull, Mechanical and Electrical systems, advanced sensors, advanced computers, advanced command and control software, advanced information system technologies, and ship based logistics support. Cost reduction and improved performance will be accomplished through sustained modeling and simulation efforts, resolutions of equipment obsolescence issues, prototype development, continued personnel reduction efforts, system performance tradeoff evaluations, and naval expeditionary warfare system engineering. Feedback from the Fleet for integrating system configurations will be accomplished through Naval Surface Warfare Centers (Philadelphia, Dahlgren, Port Hueneme, Panama City). These efforts will result in well defined specifications and drawings in system in system integration design packages that provide technical baseline for follow on ship procurements.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| ***Title:*** Systems Engineering/Integration | 0.565 | 0.689 | 0.939 | 0.000 | 0.939 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Continued Naval Expeditionary Warfare Systems Engineering efforts and integration efforts for unique LPD 17 Class systems, including efforts to resolve obsolescence issues impacting the class. | | | | | |
| ***FY 2018 Plans:***<br>- Initiate USMC Weapons Stowage studies.<br>- Studies to be conducted by HII and system vendors, with review and acceptance through the Naval Surface Warfare Centers. Leverage LXR designs where possible for potential obsolescence backfit solutions on the LPD 17 class.<br>- Complete MPDE Lube Oil Un-loader Valve Testing & Design solutions.<br>- Continue development of Fiber Optic Cable Plant Monitoring System under SBIR Phase II and transition to Phase III. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604311N / *LPD-17 Class Systems Integration* | **Project (Number/Name)**<br>2283 / *LPD-17 Class System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|---|---|---|---|---|---|
| - Continue SSDG Lube Oil & Fuel Oil Filter class design improvement studies.<br>- Continue shipboard studies for LPD 28 HM&E obsolescence and new commercial systems. Develop design, qualification, and testing projects to evaluate: expanded use of commercial systems for cost savings; and machinery/engineering control system integration with new systems and networks; MPDE Exhaust duct temperature studies and structural analysts for class improvements.<br>- Complete Knuckleboom Crane LMI sensor redesign.<br>- Conduct Environmental Qualification Testing for new systems installed on LPD 28.<br>***FY 2019 Base Plans:***<br>- Continue to conduct Environmental Qualification Testing for new systems installed on LPD 28 such as, commercial motors, pumps and tankless water heaters.<br>- Complete USMC weapons stowage studies, and complete engineering design drawings.<br>- Continue SBIR projects for LPD 17 Class Ships. Initiate Phase I projects and transition to Phase II or III.<br>- Complete SSDG Lube Oil & Fuel Oil Filter class designs.<br>- Complete Fiber Optic Cable Plat monitoring system via SBIR Phase III acquisition.<br>***FY 2019 OCO Plans:***<br>N/A<br>***FY 2018 to FY 2019 Increase/Decrease Statement:***<br>Increase of $0.250 million from FY 2018 to FY 2019 supports the Environmental Qualification Testing for new systems on the LPD 28. | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 0.565 | 0.689 | 0.939 | 0.000 | 0.939 |

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

| Line Item | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • SCN/3036: *LPD-17* | 1,831.060 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 21,322.133 |

**Remarks**

**D. Acquisition Strategy**

FY17 and out: continue developmental sole source efforts, improve quality and cost savings engineering studies.

| Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604311N / *LPD-17 Class Systems Integration* | **Project (Number/Name)**<br>2283 / *LPD-17 Class System Integration* |

**E. Performance Metrics**

N/A

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604311N / *LPD-17 Class Systems Integration* | **Project (Number/Name)**<br>2283 / *LPD-17 Class System Integration* |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Systems Engineering and Integration | WR | NSWC Crane : Crane, IN | 13.236 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 13.236 | - |
| Systems Engineering and Integration | C/CPFF | Raytheon Comp : San Diego, CA | 2.432 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.432 | - |
| LSD(X) Systems Integration (Next Gen.) | C/CPFF | CSC, Alion Science : Washington, DC | 0.549 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.549 | - |
| LSD(X) Systems Integration (Next Gen.) | WR | NSWC Carderock, NSWC Dahlgren : NSWC Beth, MD; NSWC Dahlgren, VA | 0.100 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.100 | - |
| DAWF | Various | Various : Various | 0.005 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.005 | - |
| Systems Engineering and Integration | C/CPFF | Huntington Ingalls Industries : Pascagoula, MS | 0.557 | 0.430 | Dec 2016 | 0.539 | Dec 2017 | 0.889 | Dec 2018 | - | | 0.889 | Continuing | Continuing | Continuing |
| Systems Engineering and Integration | WR | NSWC, Philadelphia : Philadelphia, PA | 1.015 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.015 | - |
| Systems Engineering and Integration | WR | NSWC, Port Hueneme : Port Hueneme, CA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.000 | - |
| Systems Engineering and Integration | C/CPFF | ULTRA Communications : Vista, CA | 0.150 | 0.135 | Jul 2017 | 0.150 | Nov 2017 | 0.050 | Nov 2018 | - | | 0.050 | Continuing | Continuing | Continuing |
| | | **Subtotal** | 18.044 | 0.565 | | 0.689 | | 0.939 | | - | | 0.939 | Continuing | Continuing | N/A |

**Remarks**

FY2018 key events include Initiating shipboard studies for LPD 28 HM&E obsolescence and new commercial systems. Developing design, qualification, and testing projects to evaluate Ship Service Diesel Generator (SSDG) Lube Oil & Fuel Oil Filter, Knuckleboom Crane LMI, MPDE Lube Oil Unloader, MPDE Barring Meter: structural changes for Boat Valley/Replenishment At Sea (RAS) - Fueling At Sea (FAS)/and Troop Berthing; Investigate small business and commercial systems for cost savings.

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy | | | Date: February 2018 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 5 | R-1 Program Element (Number/Name)<br>PE 0604311N / *LPD-17 Class Systems Integration* | Project (Number/Name)<br>2283 / *LPD-17 Class System Integration* | |

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

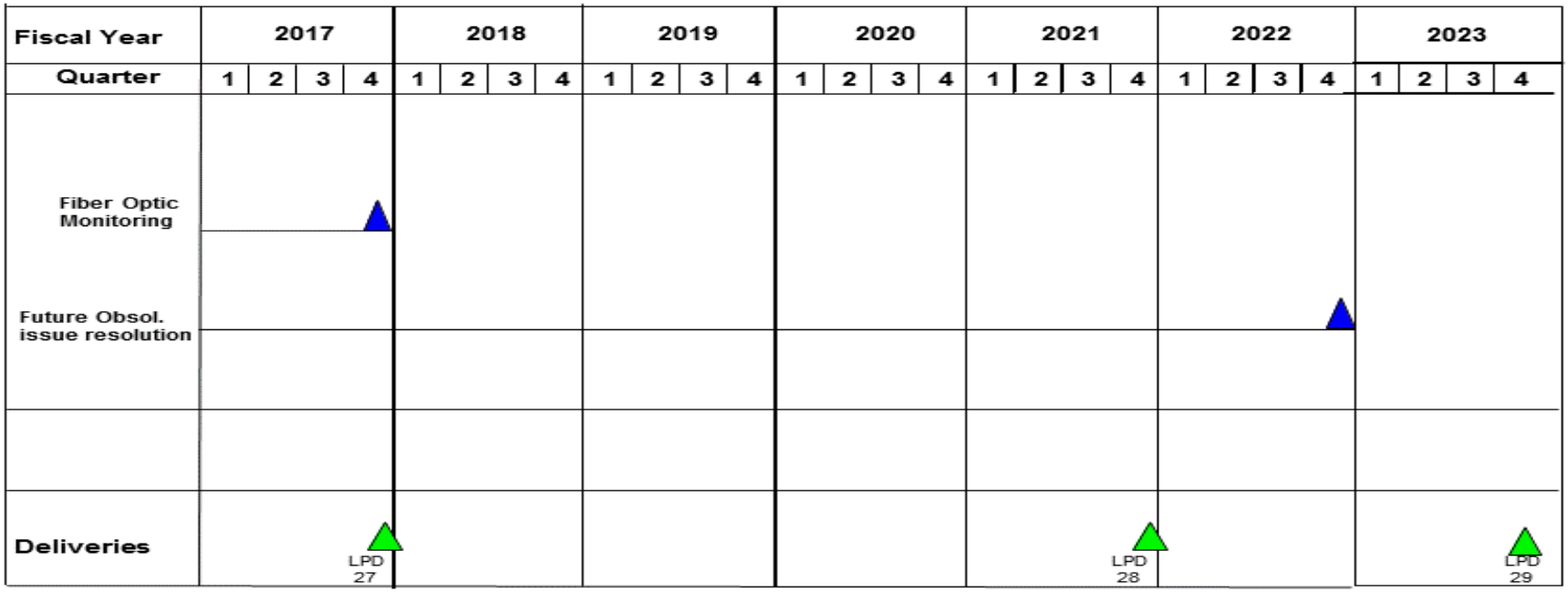
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2017 Cost | FY 2017 Award Date | FY 2018 Cost | FY 2018 Award Date | FY 2019 Base Cost | FY 2019 Base Award Date | FY 2019 OCO Cost | FY 2019 OCO Award Date | FY 2019 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OT&E/Interoperability | WR | OPTEVFOR : Norfolk, VA | 15.492 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 15.492 | - |
| | | **Subtotal** | 15.492 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 15.492 | N/A |

| | Prior Years | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 33.536 | 0.565 | | 0.689 | | 0.939 | | - | | 0.939 | Continuing | Continuing | N/A |

**Remarks**

The funds for FY 18 are in support of the continuation of the development of Fiber Optic Cable Plant Monitoring System and the continuation of the development of SSDG Lube Oil & Fuel Oil Filters, MPDE Lube Oil Un-loader design, and USMC Weapons Storage & Armory improvements. The FY19 funds are in support of conducting Environmental Qualification testing for new systems installed on LPD 28; completing USMC weapons stowage studies, engineering design drawings, SSDG Lube Oil & Fuel Oil Filter class design, and Fiber Optic Cable Plant monitoring system via SBIR Phase III acquisition; continuing SBIR projects for LPD 17 Class Ships; and initiating Phase I projects and transition to Phase II or III.

| Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604311N / *LPD-17 Class Systems Integration* | **Project (Number/Name)**<br>2283 / *LPD-17 Class System Integration* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy | | Date: February 2018 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 5 | **R-1 Program Element (Number/Name)**<br>PE 0604311N / *LPD-17 Class Systems Integration* | **Project (Number/Name)**<br>2283 / *LPD-17 Class System Integration* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***Proj 2283*** | | | | |
| Delivery (LPD 27) | 4 | 2018 | 4 | 2018 |
| Fiber Optic Monitoring | 1 | 2017 | 1 | 2018 |
| Future Obsol. Issue Resolution | 1 | 2017 | 4 | 2022 |
| Delivery (LPD 28) | 4 | 2021 | 4 | 2021 |
| Delivery (LPD 29) | 4 | 2023 | 4 | 2023 |