

# UNCLASSIFIED

| Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy   |             |         |         |              |   |               |         |         |         | Date: March 2019 |                  |            |
|--|-------------|---------|---------|--------------|---|---------------|---------|---------|---------|------------------|------------------|------------|
| Appropriation/Budget Activity<br>1319: Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD) |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |               |         |         |         |                  |                  |            |
| COST (\$ in Millions)  | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO   | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024          | Cost To Complete | Total Cost |
| Total Program Element  | 899.123     | 174.034 | 13.710  | 10.632       | -   | 10.632        | 11.026  | 11.799  | 12.142  | 12.381           | Continuing       | Continuing |
| 2232: CV/CVN Launch and Recover  | 899.123     | 174.034 | 9.710   | 10.632       | -   | 10.632        | 11.026  | 11.799  | 12.142  | 12.381           | Continuing       | Continuing |
| 9999: Congressional Adds   | 0.000       | 0.000   | 4.000   | 0.000        | -   | 0.000         | 0.000   | 0.000   | 0.000   | 0.000            | 0.000            | 4.000      |

## Note

Advanced Arresting Gear (AAG) will be funded under AAG PE 0604530N, PU 2367 in FY 2019 and later.

## A. Mission Description and Budget Item Justification

CV Launch & Recover System - This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/Rotary Wing and Vertical/Short Take Off and Landing) operating aboard aircraft carriers, amphibious assault ships, and air capable ships. This program element includes the following:

- (1) Advanced Arresting Gear (AAG)
- (2) Aircraft Launch & Recovery Equipment Modernization
- (3) Aircraft Launch and Recovery Equipment Service Life Management program

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

| B. Program Change Summary (\$ in Millions) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|--|---------|---------|--------------|-------------|---------------|
| Previous President's Budget                | 177.926 | 9.710   | 10.636       | -           | 10.636        |
| Current President's Budget                 | 174.034 | 13.710  | 10.632       | -           | 10.632        |
| Total Adjustments                          | -3.892  | 4.000   | -0.004       | -           | -0.004        |
| • Congressional General Reductions         | -       | -       |              |             |               |
| • Congressional Directed Reductions        | -       | -       |              |             |               |
| • Congressional Rescissions                | -       | -       |              |             |               |
| • Congressional Adds                       | -       | 4.000   |              |             |               |
| • Congressional Directed Transfers         | -       | -       |              |             |               |
| • Reprogrammings                           | -       | -       |              |             |               |
| • SBIR/STTR Transfer                       | -3.892  | 0.000   |              |             |               |
| • Program Adjustments                      | 0.000   | 0.000   | -0.008       | -           | -0.008        |
| • Rate/Misc Adjustments                    | 0.000   | 0.000   | 0.004        | -           | 0.004         |

**UNCLASSIFIED**

|  |  |   |  |
|--|--|---|--|
| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2020 Navy  |  | <b>Date:</b> March 2019   |  |
| <b>Appropriation/Budget Activity</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy I BA 5: System Development &amp; Demonstration (SDD)</i> |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604512N / <i>Shipboard Aviation Systems</i> |  |

| <p><b><u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u></b></p> <p><b>Project:</b> 9999: <i>Congressional Adds</i></p> <p style="padding-left: 40px;">Congressional Add: <i>Improving Aircraft Carrier Readiness</i></p><br><br><br><p><b><u>Change Summary Explanation</u></b></p> <p>Cost/Summary: AAG funding included under 0604512N in FY 2018 and prior.</p> <p>Schedule: N/A</p> <p>Technical: AAG established in its own PE and PU in FY 2019 and out.</p> | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="padding: 5px;">FY 2018</th> <th style="padding: 5px;">FY 2019</th> </tr> <tr> <td style="padding: 5px;">0.000</td> <td style="padding: 5px;">4.000</td> </tr> <tr> <td style="padding: 5px;">0.000</td> <td style="padding: 5px;">4.000</td> </tr> <tr> <td style="padding: 5px;">0.000</td> <td style="padding: 5px;">4.000</td> </tr> </table> | FY 2018 | FY 2019 | 0.000 | 4.000 | 0.000 | 4.000 | 0.000 | 4.000 |
|---|--|---------|---------|-------|-------|-------|-------|-------|-------|
| FY 2018   | FY 2019  |         |         |       |       |       |       |       |       |
| 0.000   | 4.000  |         |         |       |       |       |       |       |       |
| 0.000   | 4.000  |         |         |       |       |       |       |       |       |
| 0.000   | 4.000  |         |         |       |       |       |       |       |       |

**UNCLASSIFIED**

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy |             |         |         |              |   |               |         |         |   | Date: March 2019 |                  |            |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---|------------------|------------------|------------|
| Appropriation/Budget Activity<br>1319 / 5               |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |               |         |         | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |                  |                  |            |
| COST (\$ in Millions)                                   | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO   | FY 2020 Total | FY 2021 | FY 2022 | FY 2023   | FY 2024          | Cost To Complete | Total Cost |
| 2232: CV/CVN Launch and Recover                         | 899.123     | 174.034 | 9.710   | 10.632       | -   | 10.632        | 11.026  | 11.799  | 12.142  | 12.381           | Continuing       | Continuing |
| Quantity of RDT&E Articles                              |             | -       | -       | -            | -   | -             | -       | -       | -   | -                |                  |            |

**Note**

PY article includes Advanced Arresting Gear (AAG) Jet Car Track Site and two Improved Manually Operated Visual Landing Aid System (IMOVLAS) production representative models. Service Life Management Program (SLMP) test articles refer to actual units (two units per ship set).

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

This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/Rotary Wing and Vertical/Short Take-Off and Landing) operating aboard aircraft carriers (CVN), amphibious assault ships and air capable ships. This program includes the following systems under Project 2232, including the funding of production representative models for:

(1) Advanced Arresting Gear (AAG): The AAG program will design, develop, test and field an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century. The AAG Program's SDD phase test article consists of a single wire configured aircraft arresting system, which includes associated hardware and software needed to conduct system integrated testing by arresting both dead-loads and aircraft. Starting FY 2019 and later, AAG is funded under program element 0604530N.

(2) Aircraft Launch & Recovery Equipment (ALRE) Modernization: ALRE Modernization encompasses efforts required to ensure continued functional performance, operational relevance, and cybersecurity accreditation for all product lines across the ALRE program. This includes efforts required to resolve emerging obsolescence issues (both hardware and software), implement fleet driven operational capability upgrades, and comply with cybersecurity requirements and computer task order requirements for security threat mitigation. Effort includes:

(a) Improved Manually Operated Visual Landing Aid System (IMOVLAS): IMOVLAS will be the manual backup for Improved Fresnel Lens Optical Landing System (IFLOLS), which is the primary carrier Visual Landing Aid. IMOVLAS will be used in high sea states or if IFLOLS is inoperable. IMOVLAS will mirror current IFLOLS configuration in size & display.

(3) Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP): The ALRE SLMP for Launcher and Recovery is required to sustain carrier aviation operations of higher energy aircraft launch and recoveries that are increasing loads on the ALRE systems, and that are affecting availability, maintainability and cost. This program will consist of service life assessment and extension initiatives and will establish the design foundation (structural, reliability, and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed. Two SLMP prototypes were procured in FY 2018.

## UNCLASSIFIED

|  |  |   |            |   |                |                  |
|--|--|---|------------|---|----------------|------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy  |  |   |            | Date: March 2019  |                |                  |
| Appropriation/Budget Activity<br>1319 / 5  |  | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |            | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |                |                  |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)   |  | FY 2018   | FY 2019    | FY 2020<br>Base   | FY 2020<br>OCO | FY 2020<br>Total |
| <b>Title:</b> Advanced Arresting Gear (AAG)<br><br><b>Articles:</b><br><br><b>Description:</b> The Advanced Arresting Gear (AAG) program is designing, developing, testing and fielding an aircraft arrestment system to replace the legacy Mark 7 arresting gear. Effort moved to PE 0604530N/ PU 2367 in FY 2019 and later.<br><br><b>FY 2019 Plans:</b><br>N/A<br><br><b>FY 2020 Base Plans:</b><br>N/A<br><br><b>FY 2020 OCO Plans:</b><br>N/A |  | 166.634<br>-  | 0.000<br>- | 0.000<br>-  | 0.000<br>-     | 0.000<br>-       |
| <b>Title:</b> Aircraft Launch & Recovery Equipment Modernization<br><br><b>Articles:</b><br><br><b>Description:</b> Improved Manually Operated Visual Landing Aid System (IMOVLAS) to improve carrier aviation operations.<br><br><b>FY 2019 Plans:</b><br>N/A<br><br><b>FY 2020 Base Plans:</b><br>N/A<br><br><b>FY 2020 OCO Plans:</b><br>N/A  |  | 0.575<br>-  | 0.000<br>- | 0.000<br>-  | 0.000<br>-     | 0.000<br>-       |
| <b>Title:</b> Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP)<br><br><b>Articles:</b><br><br><b>Description:</b> ALRE SLMP analyzes launch and recovery equipment to determine feasible fielded equipment improvements.<br><br><b>FY 2019 Plans:</b>  |  | 6.825<br>2  | 9.710<br>- | 10.632<br>-   | 0.000<br>-     | 10.632<br>-      |

**UNCLASSIFIED**

|   |           |           |                 |   |                  |           |           |   |                  |                     |                  |
|---|-----------|-----------|-----------------|---|------------------|-----------|-----------|---|------------------|---------------------|------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy   |           |           |                 |   |                  |           |           |   | Date: March 2019 |                     |                  |
| Appropriation/Budget Activity<br>1319 / 5   |           |           |                 | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |                  |           |           | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |                  |                     |                  |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)  |           |           |                 |   |                  |           | FY 2018   | FY 2019   | FY 2020<br>Base  | FY 2020<br>OCO      | FY 2020<br>Total |
| Conduct land-based testing of Crosshead and Fixed Sheave prototypes. Continue analysis, design, development and testing of Recovery Assist, Securing and Traversing (RAST) components and subcomponents. Includes efforts to remove and install prototypes from the test site as well as execute fleet representative traps to compare engineering models for Crosshead and Fixed Sheaves and Main Engine Cylinders. Conduct developmental testing of Advanced Purchase Cables.<br><br><b>FY 2020 Base Plans:</b><br>Continue land-based testing of Crosshead and Fixed Sheave prototypes. Continue the testing for the Recovery Assist, Securing and Traversing (RAST) service life assessment. Begin the Aircraft Ship Integrated Secure and Transfer (ASIST) service life assessment. Start analysis and development of testing for Jet Blast Deflector (JBD) service life assessment.<br><br><b>FY 2020 OCO Plans:</b><br>N/A<br><br><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b><br>The increase from FY 2019 to FY 2020 is to support the service life assessment for the Aircraft Ship Integrated Secure and Transfer (ASIST) and the Jet Blast Deflector (JBD). |           |           |                 |   |                  |           |           |   |                  |                     |                  |
| Accomplishments/Planned Programs Subtotals  |           |           |                 |   |                  |           | 174.034   | 9.710   | 10.632           | 0.000               | 10.632           |
| C. Other Program Funding Summary (\$ in Millions)   |           |           |                 |   |                  |           |           |   |                  |                     |                  |
| Line Item   | FY 2018   | FY 2019   | FY 2020<br>Base | FY 2020<br>OCO  | FY 2020<br>Total | FY 2021   | FY 2022   | FY 2023   | FY 2024          | Cost To<br>Complete | Total Cost       |
| • OPN/4213: Aircraft Launch & Recovery Equipment-Aircraft Launch & Recovery Equipment   | 103.340   | 105.943   | 145.601         | 13.420  | 159.021          | 119.366   | 120.849   | 143.300   | 134.933          | Continuing          | Continuing       |
| • OPN/4217: Advanced Arresting Gear   | 10.900    | 11.054    | 4.725           | -   | 4.725            | 3.118     | 2.442     | 2.491   | 2.540            | 262.172             | 299.442          |
| • SCN/2001: Carrier Replacement Program   | 4,130.704 | 1,573.181 | 2,347.000       | -   | 2,347.000        | 2,644.700 | 2,323.613 | 1,929.000   | 1,718.000        | 8,447.524           | 47,802.298       |
| Remarks   |           |           |                 |   |                  |           |           |   |                  |                     |                  |
| OPN 4213 includes a portion of line item funding for Aircraft Launch & Recovery Equipment.  |           |           |                 |   |                  |           |           |   |                  |                     |                  |

UNCLASSIFIED

|  |   |   |
|--|---|---|
| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy  |   | Date: March 2019  |
| Appropriation/Budget Activity<br>1319 / 5  | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |
| <b>D. Acquisition Strategy</b><br><p>Advanced Arresting Gear (AAG): The Navy competitively awarded two Cost Plus Fixed Fee Technical Development phase contracts to develop the AAG system. Upon completion of the Preliminary Design and Integrated Baseline reviews, the Navy awarded a single Cost Plus Award Fee option to General Atomics for the System Development and Demonstration (SDD) phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car Track Site and Runway Arrested Landing Site. Continuing development on the SDD contract awarded in 2004.</p> <p>Aircraft Launch &amp; Recovery Equipment Modernization:<br/>Improved Manually Operated Visual Landing Aid System (IMOVLAS): The Navy will develop IMOVLAS using commercial equipment racks, processors and Light Emitting Diodes (LEDs).</p> <p>Aircraft Launch &amp; Recovery Equipment Service Life Management Program (SLMP): This program will consist of Service Life Assessment and Extension initiatives and will establish the design foundation (structural, reliability and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed.</p> <b>E. Performance Metrics</b><br><p>Advanced Arresting Gear (AAG) will complete System Development and Demonstration integrated testing at Jet Car Track Site and Runway Arrested Landing Site. AAG will demonstrate its key performance parameters and readiness for operational test.</p> |   |   |

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy** **Date:** March 2019

|  |   |   |
|--|---|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604512N / <i>Shipboard Aviation Systems</i> | <b>Project (Number/Name)</b><br>2232 / <i>CV/CVN Launch and Recover</i> |
|--|---|---|

| Product Development (\$ in Millions)     |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 Total |                  |            |                          |
|--|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item                       | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          | Cost To Complete | Total Cost | Target Value of Contract |
| Primary HW Dev-AAG                       | C/CPAF                 | Gen Atomics : San Diego, CA    | 620.014     | 96.769  | Dec 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | 23.709           | 740.492    | 740.492                  |
| Primary HW Dev-AAG                       | WR                     | NAWCAD : Lakehurst, NJ         | 57.875      | 28.852  | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Primary HW Dev - AAG                     | C/CPAF                 | ESL : Cranston, RI             | 3.300       | 3.531   | Dec 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | 2.714            | 9.545      | 9.545                    |
| System Eng-AAG                           | WR                     | NAWCAD : Lakehurst, NJ         | 28.659      | 8.706   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Primary HW Dev-Modern IMOVLAS            | WR                     | NAWCAD : Lakehurst, NJ         | 3.138       | 0.211   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| System Eng-Modern IMOVLAS                | WR                     | NAWCAD : Lakehurst, NJ         | 0.654       | 0.069   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Primary HW Dev-SLMP                      | WR                     | NAWCAD : Lakehurst, NJ         | 15.254      | 1.173   | Nov 2017   | 1.558   | Dec 2018   | 1.761        | Nov 2019   | -           |            | 1.761         | Continuing       | Continuing | Continuing               |
| Prior Year Cost No Longer Funded in FYDP | Various                | Various : Various              | 53.148      | 0.000   |            | 0.000   |            | 0.000        |            | -           |            | 0.000         | 0.000            | 53.148     | -                        |
| <b>Subtotal</b>                          |                        |                                | 782.042     | 139.311 |            | 1.558   |            | 1.761        |            | -           |            | 1.761         | Continuing       | Continuing | N/A                      |

**Remarks**

Note: The contractor General Atomics, San Diego, CA has waived all remaining Award Fees.  
The increase from FY 2019 to FY 2020 is to support the service life assessment for the Aircraft Ship Integrated Secure and Transfer (ASIST) and the Jet Blast Deflector (JBD).

| Support (\$ in Millions)     |                        |                                |             | FY 2018 |            | FY 2019 |            | FY 2020 Base |            | FY 2020 OCO |            | FY 2020 Total |                  |            |                          |
|------------------------------|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item           | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          | Cost To Complete | Total Cost | Target Value of Contract |
| ILS-AAG                      | WR                     | NAWCAD : Lakehurst, NJ         | 18.723      | 5.439   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Government Eng Support - AAG | WR                     | Various : Various              | 0.381       | 0.409   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| ILS-Modern IMOVLAS           | WR                     | NAWCAD : Lakehurst, NJ         | 0.428       | 0.110   | Nov 2017   | 0.000   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Studies & Analysis-SLMP      | WR                     | NAWCAD : Lakehurst, NJ         | 14.048      | 3.684   | Nov 2017   | 2.605   | Dec 2018   | 2.829        | Nov 2019   | -           |            | 2.829         | Continuing       | Continuing | Continuing               |

**UNCLASSIFIED**

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy   |                        |                                |             |         |            |   |            |              |            |   |            | Date: March 2019 |                  |            |                          |
|--|------------------------|--------------------------------|-------------|---------|------------|---|------------|--------------|------------|---|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity<br>1319 / 5  |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |            |              |            | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |            |                  |                  |            |                          |
| Support (\$ in Millions)   |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020 Base |            | FY 2020 OCO   |            | FY 2020 Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost         | Award Date | Cost  | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Prior Year Cost No Longer Funded in FYDP   | Various                | Various : Various              | 1.741       | 0.000   |            | 0.000   |            | 0.000        |            | -   |            | 0.000            | 0.000            | 1.741      | -                        |
| Subtotal   |                        |                                | 35.321      | 9.642   |            | 2.605   |            | 2.829        |            | -   |            | 2.829            | Continuing       | Continuing | N/A                      |
| Remarks  |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |
| The increase from FY 2019 to FY 2020 is to support the service life assessment for the Aircraft Ship Integrated Secure and Transfer (ASIST) and the Jet Blast Deflector (JBD). |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |
| Test and Evaluation (\$ in Millions)   |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020 Base |            | FY 2020 OCO   |            | FY 2020 Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost         | Award Date | Cost  | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Dev Test & Eval-AAG  | WR                     | NAWCAD : Lakehurst, NJ         | 59.870      | 22.167  | Nov 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | Continuing       | Continuing | Continuing               |
| Operational T&E-AAG  | WR                     | Various : Various              | 2.589       | 0.306   | Nov 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | Continuing       | Continuing | Continuing               |
| Integrated Testing-Modern IMOVLAS  | WR                     | NAWCAD : Lakehurst, NJ         | 0.309       | 0.185   | Nov 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | Continuing       | Continuing | Continuing               |
| Materials/Validation Testing-SLMP  | WR                     | NAWCAD : Lakehurst, NJ         | 12.644      | 1.968   | Nov 2017   | 5.547   | Dec 2018   | 6.042        | Nov 2019   | -   |            | 6.042            | Continuing       | Continuing | Continuing               |
| Prior Year Cost No Longer Funded in FYDP   | Various                | Various : Various              | 3.570       | 0.000   |            | 0.000   |            | 0.000        |            | -   |            | 0.000            | 0.000            | 3.570      | -                        |
| Subtotal   |                        |                                | 78.982      | 24.626  |            | 5.547   |            | 6.042        |            | -   |            | 6.042            | Continuing       | Continuing | N/A                      |
| Remarks  |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |
| The increase from FY 2019 to FY 2020 is to support the service life assessment for the Aircraft Ship Integrated Secure and Transfer (ASIST) and the Jet Blast Deflector (JBD). |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |
| Management Services (\$ in Millions)   |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020 Base |            | FY 2020 OCO   |            | FY 2020 Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost         | Award Date | Cost  | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Program Mgmt Support   | C/CPFF                 | Sierra : California, MD        | 2.038       | 0.300   | Dec 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | 1.003            | 3.341      | 3.341                    |
| Travel   | Reqn                   | NAVAIR : Patuxent River, MD    | 0.505       | 0.040   | Oct 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | Continuing       | Continuing | Continuing               |



**UNCLASSIFIED**

|  |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |
|--|------------------------|--------------------------------|-------------|---------|------------|---|------------|--------------|------------|---|------------|------------------|------------------|------------|--------------------------|
| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy |                        |                                |             |         |            |   |            |              |            |   |            | Date: March 2019 |                  |            |                          |
| Appropriation/Budget Activity<br>1319 / 5              |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |            |              |            | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |            |                  |                  |            |                          |
| Management Services (\$ in Millions)                   |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020 Base |            | FY 2020 OCO   |            | FY 2020 Total    |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost         | Award Date | Cost  | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Program Mgmt Support                                   | Various                | Various : Various              | 0.100       | 0.115   | Nov 2017   | 0.000   |            | 0.000        |            | -   |            | 0.000            | 0.000            | 0.215      | -                        |
| Prior Year Cost No Longer Funded in FYDP               | Various                | Various : Various              | 0.135       | 0.000   |            | 0.000   |            | 0.000        |            | -   |            | 0.000            | 0.000            | 0.135      | -                        |
| Subtotal   |                        |                                | 2.778       | 0.455   |            | 0.000   |            | 0.000        |            | -   |            | 0.000            | Continuing       | Continuing | N/A                      |
|  |                        |                                | Prior Years | FY 2018 |            | FY 2019   |            | FY 2020 Base |            | FY 2020 OCO   |            | FY 2020 Total    | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals                                    |                        |                                | 899.123     | 174.034 |            | 9.710   |            | 10.632       |            | -   |            | 10.632           | Continuing       | Continuing | N/A                      |
| Remarks  |                        |                                |             |         |            |   |            |              |            |   |            |                  |                  |            |                          |

# UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy

Date: March 2019

Appropriation/Budget Activity

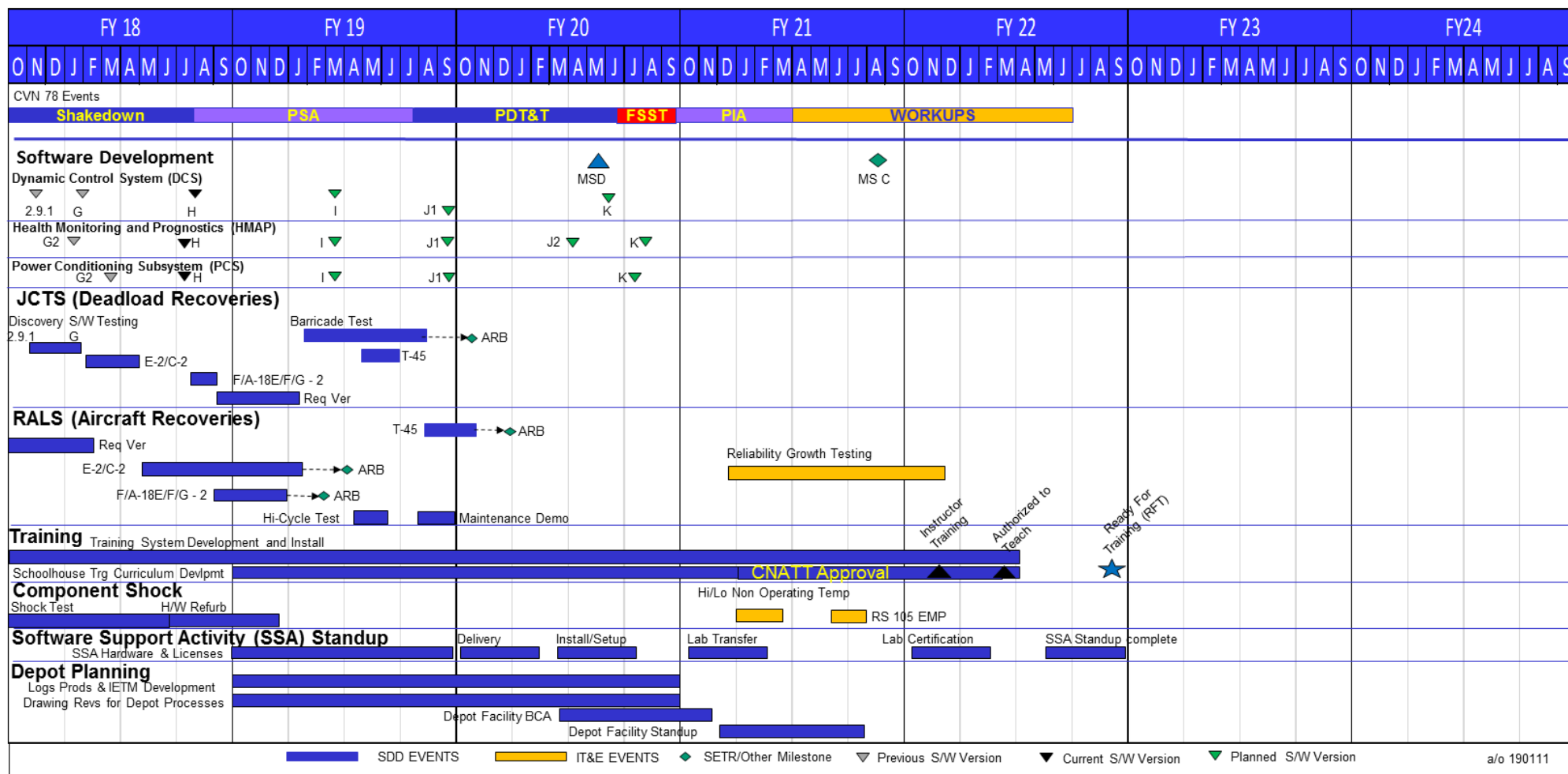
1319 / 5

R-1 Program Element (Number/Name)

PE 0604512N / Shipboard Aviation Systems

Project (Number/Name)

2232 / CV/CVN Launch and Recover



**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy**

**Date:** March 2019

### Appropriation/Budget Activity

1319 / 5

### R-1 Program Element (Number/Name)

PE 0604512N / Shipboard Aviation Systems

Project (Number/Name)

2232 / CV/CVN Launch and Recover

# ALRE SLMP Schedule

[illegible]

a/o 180615

**UNCLASSIFIED**

PE 0604512N: *Shipboard Aviation Systems*  
Navy

R-1 Line #128

[illegible]

PE 0604512N / Shipboard Aviation Systems

2232 / CV/CVN Launch and Recover

**UNCLASSIFIED**

[illegible]

# UNCLASSIFIED

|  |   |   |                  |
|--|---|---|------------------|
| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy |   |   | Date: March 2019 |
| Appropriation/Budget Activity<br>1319 / 5          | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems | Project (Number/Name)<br>2232 / CV/CVN Launch and Recover |                  |

## Schedule Details

| Events by Sub Project   | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| <b>ADVANCED ARRESTING GEAR (AAG)</b>  |         |      |         |      |
| Aquisition Milestones: Milestones: Milestone C  | 4       | 2021 | 4       | 2021 |
| Test & Evaluation: Technical Evaluation: Jet Car Test Site (JCTS) Test                            | 1       | 2018 | 1       | 2020 |
| Test & Evaluation: Technical Evaluation: Runway Arrested Landing Site Test (RALS)                 | 1       | 2018 | 1       | 2022 |
| <b>ALRE SERVICE LIFE MANAGEMENT PROGRAM (SLMP)</b>  |         |      |         |      |
| Systems Development: Hardware/Software Development: System Development                            | 1       | 2018 | 4       | 2024 |
| Test & Evaluation: Technical Evaluation: Test & Evaluation  | 1       | 2018 | 4       | 2024 |
| <b>ALRE MODERNIZATION</b>   |         |      |         |      |
| Systems Development: Hardware/Software Development: Obsolescence Redesign Development and Testing | 1       | 2018 | 4       | 2018 |
| Test and Evaluation: Technical Evaluation: Integrated Test  | 1       | 2018 | 3       | 2018 |

**UNCLASSIFIED**

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy |             |         |         |              |   |               |         |         |  | Date: March 2019 |                  |            |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|--|------------------|------------------|------------|
| Appropriation/Budget Activity<br>1319 / 5               |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |               |         |         | Project (Number/Name)<br>9999 / Congressional Adds |                  |                  |            |
| COST (\$ in Millions)                                   | Prior Years | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO   | FY 2020 Total | FY 2021 | FY 2022 | FY 2023  | FY 2024          | Cost To Complete | Total Cost |
| 9999: Congressional Adds                                | 0.000       | 0.000   | 4.000   | 0.000        | -   | 0.000         | 0.000   | 0.000   | 0.000  | 0.000            | 0.000            | 4.000      |
| Quantity of RDT&E Articles                              |             | -       | -       | -            | -   | -             | -       | -       | -  | -                |                  |            |

**Note**

Congressional Add. Program Increase to Improve Aircraft Carrier Readiness.

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

Congressional Add. Program Increase to Improve Aircraft Carrier Readiness.

**B. Accomplishments/Planned Programs (\$ in Millions)**

|   | <b>FY 2018</b> | <b>FY 2019</b> |
|---|----------------|----------------|
| <b><i>Congressional Add:</i></b> Improving Aircraft Carrier Readiness   | 0.000          | 4.000          |
| <b><i>FY 2018 Accomplishments:</i></b> N/A  |                |                |
| <b><i>FY 2019 Plans:</i></b> Funding will support Real-time Aircraft Launch and Recovery Equipment (ALRE) systems Check (REACH) system efforts to improve aircraft carrier readiness. |                |                |
| <b>Congressional Adds Subtotals</b>   | 0.000          | 4.000          |

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

N/A

**UNCLASSIFIED**

|  |                        |                                |             |         |            |   |            |                 |            |  |            |                  |                  |            |                          |
|--|------------------------|--------------------------------|-------------|---------|------------|---|------------|-----------------|------------|--|------------|------------------|------------------|------------|--------------------------|
| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy |                        |                                |             |         |            |   |            |                 |            |  |            | Date: March 2019 |                  |            |                          |
| Appropriation/Budget Activity<br>1319 / 5              |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |            |                 |            | Project (Number/Name)<br>9999 / Congressional Adds |            |                  |                  |            |                          |
| Product Development (\$ in Millions)                   |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020<br>Base |            | FY 2020<br>OCO                                     |            | FY 2020<br>Total |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost   | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Primary HW Development                                 | TBD                    | TBD : TBD                      | 0.000       | 0.000   |            | 3.500   | Sep 2019   | 0.000           |            | -  |            | 0.000            | 0.000            | 3.500      | -                        |
| Subtotal   |                        |                                | 0.000       | 0.000   |            | 3.500   |            | 0.000           |            | -  |            | 0.000            | 0.000            | 3.500      | N/A                      |
| Support (\$ in Millions)                               |                        |                                |             | FY 2018 |            | FY 2019   |            | FY 2020<br>Base |            | FY 2020<br>OCO                                     |            | FY 2020<br>Total |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost   | Award Date | Cost             | Cost To Complete | Total Cost | Target Value of Contract |
| Government Eng Spt                                     | WR                     | NAWCAD : Lakehurst, NJ         | 0.000       | 0.000   |            | 0.500   | Feb 2019   | 0.000           |            | -  |            | 0.000            | 0.000            | 0.500      | -                        |
| Subtotal   |                        |                                | 0.000       | 0.000   |            | 0.500   |            | 0.000           |            | -  |            | 0.000            | 0.000            | 0.500      | N/A                      |
|  |                        |                                | Prior Years | FY 2018 |            | FY 2019   |            | FY 2020<br>Base |            | FY 2020<br>OCO                                     |            | FY 2020<br>Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals                                    |                        |                                | 0.000       | 0.000   |            | 4.000   |            | 0.000           |            | -  |            | 0.000            | 0.000            | 4.000      | N/A                      |
| Remarks  |                        |                                |             |         |            |   |            |                 |            |  |            |                  |                  |            |                          |

UNCLASSIFIED

|   |         |    |    |    |         |    |    |                     |         |    |   |                   |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |
|---|---------|----|----|----|---------|----|----|---------------------|---------|----|---|-------------------|---------|----|----|----|---------|----|--|----|------------------|----|----|----|---------|----|----|----|
| Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy |         |    |    |    |         |    |    |                     |         |    |   |                   |         |    |    |    |         |    |  |    | Date: March 2019 |    |    |    |         |    |    |    |
| Appropriation/Budget Activity<br>1319 / 5         |         |    |    |    |         |    |    |                     |         |    | R-1 Program Element (Number/Name)<br>PE 0604512N / Shipboard Aviation Systems |                   |         |    |    |    |         |    | Project (Number/Name)<br>9999 / Congressional Adds |    |                  |    |    |    |         |    |    |    |
| Proj 9999   | FY 2018 |    |    |    | FY 2019 |    |    |                     | FY 2020 |    |   |                   | FY 2021 |    |    |    | FY 2022 |    |  |    | FY 2023          |    |    |    | FY 2024 |    |    |    |
|   | 1Q      | 2Q | 3Q | 4Q | 1Q      | 2Q | 3Q | 4Q                  | 1Q      | 2Q | 3Q  | 4Q                | 1Q      | 2Q | 3Q | 4Q | 1Q      | 2Q | 3Q   | 4Q | 1Q               | 2Q | 3Q | 4Q | 1Q      | 2Q | 3Q | 4Q |
| Primary HW Dev                                    |         |    |    |    |         |    |    |                     |         |    |   |                   |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |
|   |         |    |    |    |         |    |    | Contract Award<br>◆ |         |    |   | HW/SW Development |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |
| Systems Support                                   |         |    |    |    |         |    |    |                     |         |    |   |                   |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |
|   |         |    |    |    |         |    |    | Systems Support     |         |    |   |                   |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |
| 2020PB - 0604512N - 9999                          |         |    |    |    |         |    |    |                     |         |    |   |                   |         |    |    |    |         |    |  |    |                  |    |    |    |         |    |    |    |



**UNCLASSIFIED**

|   |   |  |                         |
|---|---|--|-------------------------|
| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Navy |   |  | <b>Date:</b> March 2019 |
| <b>Appropriation/Budget Activity</b><br>1319 / 5              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604512N / <i>Shipboard Aviation Systems</i> | <b>Project (Number/Name)</b><br>9999 / <i>Congressional Adds</i> |                         |

Schedule Details

| Events by Sub Project                         | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| <b><i>Proj 9999</i></b>                       |         |      |         |      |
| Primary HW Dev: Hardware/Software Development | 4       | 2019 | 4       | 2019 |
| Primary HW Dev: Hardware Software Development | 1       | 2020 | 4       | 2020 |
| Systems Support: Systems Support              | 2       | 2019 | 4       | 2020 |