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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2024 Navy **Date:** March 2023

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| <b>Appropriation/Budget Activity</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> |
|---|---|

| COST (\$ in Millions)                           | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | FY 2025 | FY 2026 | FY 2027 | FY 2028 | Cost To Complete | Total Cost |
|---|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element                           | 57.557      | 11.924  | 12.959  | 16.127       | -           | 16.127        | 15.442  | 13.630  | 13.760  | 14.036  | Continuing       | Continuing |
| 0530: <i>Mine Hunt Systems</i>                  | 31.456      | 4.741   | 2.121   | 5.673        | -           | 5.673         | 5.181   | 4.381   | 4.400   | 4.489   | Continuing       | Continuing |
| 1235: <i>Mine Warfare Planning and Analysis</i> | 26.101      | 7.183   | 10.838  | 10.454       | -           | 10.454        | 10.261  | 9.249   | 9.360   | 9.547   | Continuing       | Continuing |

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

The Surface Mine Countermeasures (SMCM) Program Element (PE) provides resources in support of development of mine countermeasures systems to provide minehunting and neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and neutralizing operations worldwide. Resources are for developing and deploying advanced minehunting and neutralization systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates; improving detection capability; decreasing sensor false alarm rates; reducing or eliminating post-mission analysis detect, classify, identify, decide time; improving neutralization time; improving network communications; automatic target recognition; and achieving in-stride detect-to-engage capability. The Surface Mine Countermeasures programs are in general platform independent and will provide detection, classification, localization, identification, neutralization, and influence clearance capabilities. Programs develop: (1) Unmanned minehunting capability for surface platforms; (2) the integration and improvement of new and existing systems (3) support for systems which detect, localize, classify, identify, and neutralize all mine types across MCM Avenger Class, Littoral Combat Ship (LCS) Class and other platforms.

- 1) The AN/AQS-20 is a minehunting and identification system with sensors housed in an underwater towed body. The sensors are designed for the detection, classification and localization of bottom, close-tethered, and volume targets, and for the identification of bottom targets. The system can be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/AQS-20.
- 2) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFVB) is a technology upgrade to the AN/SQQ-32 Towed Body which incorporated HFVB technology into the detection sonar to address performance deficiencies against new mine threats in the littorals. This upgrade was installed on MCM-1 Class ships.
- 3) AN/SLQ-60 Mine Neutralization System (MNS) Seafox on the MCM Class ships. MNS is the replacement to the existing AN/SLQ-48 Mine Neutralization System.
- 4) Mine Warfare and Environmental Decision Aids Library (MEDAL) is the U.S. Navy's single Mine Warfare (MIW) tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The current MEDAL increment, known as MEDAL Enterprise

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| <b>Appropriation/Budget Activity</b><br>1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i> | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> |
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Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning. MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces. MINEnet Global provides downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations.

5) MIW Integrated Synthetic Trainer (MIST) will provide integrated phase training for MIW staffs in end-to-end MCM scenarios. This tool will provide the capability to train MIW staffs against near peer threats.

| <b>B. Program Change Summary (\$ in Millions)</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget                       | 12.507         | 12.959         | 16.069              | -                  | 16.069               |
| Current President's Budget                        | 11.924         | 12.959         | 16.127              | -                  | 16.127               |
| Total Adjustments                                 | -0.583         | 0.000          | 0.058               | -                  | 0.058                |
| • Congressional General Reductions                | -              | -              |                     |                    |                      |
| • Congressional Directed Reductions               | -              | -              |                     |                    |                      |
| • Congressional Rescissions                       | -              | -              |                     |                    |                      |
| • Congressional Adds                              | -              | -              |                     |                    |                      |
| • Congressional Directed Transfers                | -              | -              |                     |                    |                      |
| • Reprogrammings                                  | -0.180         | 0.000          |                     |                    |                      |
| • SBIR/STTR Transfer                              | -0.404         | 0.000          |                     |                    |                      |
| • Rate/Misc Adjustments                           | 0.001          | 0.000          | 0.058               | -                  | 0.058                |

**Change Summary Explanation**

FY 2022 reflects a net decrease of \$583K for reprogramming and SBIR assessments.

FY 2023 no adjustments.

FY 2024 \$58K misc. rate adjustments

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |   |                      |                |                |   | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> |                      |                |                | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>  | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>  | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 0530: <i>Mine Hunt Systems</i>                                     | 31.456             | 4.741          | 2.121          | 5.673               | -   | 5.673                | 5.181          | 4.381          | 4.400   | 4.489                   | Continuing              | Continuing        |
| Quantity of RDT&E Articles   |                    | -              | -              | -                   | -   | -                    | -              | -              | -   | -                       |                         |                   |

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

The Mine Hunt Systems project contains resources for systems, subsystems, and sensors integrated for use with the Mine Countermeasures Unmanned Surface Vehicle (MCM USV) for mine detection, classification, localization, identification, and neutralization capabilities. Research, development, test, and evaluation efforts are for increasing capability by decreasing time required to conduct Mine Countermeasures (MCM) operations, ensuring low risk to naval and commercial vessels, and removing the man from the minefield. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, and reducing post-mission analysis time for detection, classification, and identification.

The AN/AQS-20C is a mine hunting and identification system with sensors housed in an underwater towed body. The AN/AQS-20C integrates the Wideband Forward Looking Sonar (WBFLS), multifunction Synthetic Aperture Sonar (SAS), and Digital Gap Fill Sonar (DGFS) for the detection, classification and localization of bottom, close-tethered, volume targets. Integration of the Electro-Optic Identification (EOID) sensor enables identification of bottom targets. The system can be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package (MP) or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/AQS-20C. Materiel reliability, obsolescence, and performance Engineering Change Proposal (ECP) efforts continue beyond FY 2027. In FY 2022, the AN/AQS-20 Program completed DT/OT with MCM USV, and supported the MCM Mission Package (MP) IOT&E. Completion of DT/OT with the MCM USV satisfies AN/AQS-20 IOT&E requirements.

In FY 2024, the AN/AQS-20 program will continue development of Automated Target Recognition (ATR) efforts, Acoustic ID, ensure compliance with cybersecurity requirements, and resolve system obsolescence. Based on MCM MP IOT&E and MCM USV DT/OT, corrective action updates will be integrated and ECPs incorporated in to the system. Offshore integration and test will verify product development efforts, and design upgrades due to obsolescence.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

|  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> AN/AQS-20 Product Development  | 2.137          | 1.161          | 3.349               | 0.000              | 3.349                |
| <b>Articles:</b>   | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b>  |                |                |                     |                    |                      |
| - Continue development of user tools and training curriculum to improve iPMA performance   |                |                |                     |                    |                      |
| - Development Integration of ATR capability into the iPMA and user interface to improve Sailor performance                               |                |                |                     |                    |                      |
| - Develop test plan and tactics for implementation of in-stride high resolution image supporting identification requirement on AN/AQS-20 |                |                |                     |                    |                      |
| - Continue development of super classification of mines by leveraging machine learning   |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <p>- Improve ATR by leveraging machine learning through algorithm development and multi sensor data fusion to increase probability of detection and reduced false cells.</p> <p>- Develop ECPs to resolve findings from MCM USV TECHEVAL &amp; IOT&amp;E and MCM MP TECHEVAL &amp; IOT&amp;E for LCS Independence Variant</p> <p><b>FY 2024 Base Plans:</b></p> <p>- Continued Improvement of ATR through algorithm refinement for new environments and targets to reduce false calls. ATR integration with MCM USV system verification and test</p> <p>- Improve iPMA sailor experience by reducing workload, complexity and performance through use of automation</p> <p>- Complete ECPs to resolve findings from MCM USV TECHEVAL &amp; IOT&amp;E and MCM MP TECHEVAL &amp; IOT&amp;E for LCS Independence Variant</p> <p><b>FY 2024 OCO Plans:</b></p> <p>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p> <p>Increase in FY2024 funds iPMA ATR and reduction in workload improvements.</p> |                |                |                     |                    |                      |
| <p><b>Title:</b> AN/AQS-20 Support</p> <p align="right"><b>Articles:</b></p>   | 0.800          | 0.484          | 1.780               | 0.000              | 1.780                |
| <p><b>FY 2023 Plans:</b></p> <p>- Provide ongoing technical and management support to AN/AQS-20 product development</p> <p>- Provide engineer support to meet cyber security RMF process</p> <p>- Provide engineer support for FRP units modification and design upgrades due to obsolescence</p> <p>- Continue assess, score, and update AN/AQS-20 Block 2 tactics based on Mission Planning and Post Mission Analysis performance improvement from ATR and iPMA improvements</p> <p><b>FY 2024 Base Plans:</b></p> <p>- Provide ongoing technical and management support to AN/AQS-20 product development</p> <p>- Provide engineer support, design and upgrade for obsolescence of aging components and software within the Q-20C</p> <p>- Update AN/AQS-20 Block 2 and A to C tactics based on new capability provided from ATR, Acoustic ID and Post Mission Analysis performance improvements</p> <p><b>FY 2024 OCO Plans:</b></p>   | -              | -              | -                   | -                  | -                    |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy  |   |   | <b>Date:</b> March 2023 |                     |                    |                      |
| <b>Appropriation/Budget Activity</b><br>1319 / 4  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |                         |                     |                    |                      |
| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>   |   |   |                         |                     |                    |                      |
|   |   | <b>FY 2022</b>  | <b>FY 2023</b>          | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
| N/A   |   |   |                         |                     |                    |                      |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>Increase in FY2024 support updates to AQS-20 Block 2 A to C tactics.                                    |   |   |                         |                     |                    |                      |
| <b>Title:</b> AN/AQS-20 Test and Evaluation   |   | 1.612   | 0.340                   | 0.000               | 0.000              | 0.000                |
|   | <b>Articles:</b>  | -   | -                       | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>-Conduct test planning for off shore integration and test to verify product development efforts, and design upgrades due to obsolescence |   |   |                         |                     |                    |                      |
| <b>FY 2024 Base Plans:</b><br>N/A   |   |   |                         |                     |                    |                      |
| <b>FY 2024 OCO Plans:</b><br>N/A  |   |   |                         |                     |                    |                      |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>All testing will be completed in FY2023.  |   |   |                         |                     |                    |                      |
| <b>Title:</b> AN/AQS-20 Management Services   |   | 0.192   | 0.136                   | 0.544               | 0.000              | 0.544                |
|   | <b>Articles:</b>  | -   | -                       | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>- Provide planning and management for the AN/AQS-20 program<br>- Continue to provide Program Office travel support                       |   |   |                         |                     |                    |                      |
| <b>FY 2024 Base Plans:</b><br>- Provide planning and management for the AN/AQS-20 program<br>- Continue to provide Program Office travel support                  |   |   |                         |                     |                    |                      |
| <b>FY 2024 OCO Plans:</b><br>N/A  |   |   |                         |                     |                    |                      |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br>The increase in FY2024 support the increased program efforts from FY2023.                               |   |   |                         |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>   |   | 4.741   | 2.121                   | 5.673               | 0.000              | 5.673                |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |

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

| <u>Line Item</u>                           | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2024</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>Cost To</u>  |                   |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-------------------|
|  |                |                | <u>Base</u>    | <u>OCO</u>     | <u>Total</u>   |                |                |                |                | <u>Complete</u> | <u>Total Cost</u> |
| • OPN/1601: <i>LCS MCM Mission Modules</i> | 30.119         | 92.495         | 93.961         | -              | 93.961         | 122.654        | 103.972        | 59.906         | 61.344         | 1,508.277       | 2,664.640         |

**Remarks**

OPN/1601 - The above funding line accounts for several programs, of which the Mine Hunt Systems program is only a portion.

**D. Acquisition Strategy**

AN/AQS-20 Low-Rate Initial Production (LRIP) procurement continued following the Block 2 (AQS-20C units) competitive contract award in FY 2014. In FY 2020, the AN/AQS-20 program leveraged the Unmanned Surface Vehicle (USV) Family of Systems (FoS) Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) to award multiple risk reduction efforts. The risk reduction efforts helped increase competition for FY 2025 sonar production. The risk reduction effort transitioned volume sonar capability and familiarized industry to specific sonar requirement based on the finding from FY 2019 market research. In FY 2021, a sole-source AN/AQS-20A (Block 1) to AN/AQS-20C (Block 2) upgrade contract was awarded to Raytheon to continue delivering sonars to support integration and testing for the LCS MCM MP. Risk reduction effort will inform the update of acquisition documentation in 2023 in order to define the next generation Minehunt Towed Sonar and ensure future competition. In the FY 2024 Request for Proposal will initiate competition for the FY 2025 sonar production contract.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy |                        |                                |             |  |            |         |            |                          |            |             |            | Date: March 2023 |                  |            |                          |
|--|------------------------|--------------------------------|-------------|--|------------|---------|------------|--------------------------|------------|-------------|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity                          |                        |                                |             | R-1 Program Element (Number/Name)          |            |         |            | Project (Number/Name)    |            |             |            |                  |                  |            |                          |
| 1319 / 4   |                        |                                |             | PE 0604127N / Surface Mine Countermeasures |            |         |            | 0530 / Mine Hunt Systems |            |             |            |                  |                  |            |                          |
| Product Development (\$ in Millions)                   |                        |                                |             | FY 2022                                    |            | FY 2023 |            | FY 2024 Base             |            | FY 2024 OCO |            | FY 2024 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 |
| AN/AQS-20 Block 2 MCM USV Integration                  | C/CPFF                 | Raytheon : Portsmouth, RI      | 0.300       | 0.737                                      | Nov 2021   | 0.000   |            | 0.623                    | Dec 2023   | -           |            | 0.623            | 0.000            | 1.660      | -                        |
| AN/AQS-20 Block 2                                      | C/CPFF                 | Raytheon : Portsmouth, RI      | 4.959       | 0.315                                      | Nov 2021   | 0.531   | Nov 2022   | 0.840                    | Dec 2023   | -           |            | 0.840            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Block 2                                      | C/CPFF                 | ARL/UT : Austin, TX            | 1.350       | 0.485                                      | Nov 2021   | 0.100   | Nov 2022   | 0.363                    | Dec 2023   | -           |            | 0.363            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Block 2 PMA                                  | WR                     | NSWC, PC : Panama City, FL     | 2.100       | 0.250                                      | Oct 2021   | 0.300   | Oct 2022   | 0.311                    | Nov 2023   | -           |            | 0.311            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Block 2 PMA                                  | C/CPFF                 | ARL/UT : Austin, TX            | 2.178       | 0.350                                      | Dec 2021   | 0.230   | Dec 2022   | 0.552                    | Dec 2023   | -           |            | 0.552            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Risk Reduction                               | C/FFP                  | Various : Various              | 0.500       | 0.000                                      |            | 0.000   |            | 0.000                    |            | -           |            | 0.000            | 0.000            | 0.500      | -                        |
| AN/AQS-20 Block 2 ATR                                  | C/CPFF                 | JHU-APL : Laurel, MD           | 0.000       | 0.000                                      |            | 0.000   |            | 0.297                    | Dec 2023   | -           |            | 0.297            | 0.000            | 0.297      | -                        |
| AN/AQS-20 Block 2 ATR                                  | C/CPFF                 | NGC : Annapolis, MD            | 0.000       | 0.000                                      |            | 0.000   |            | 0.363                    | Dec 2023   | -           |            | 0.363            | 0.000            | 0.363      | -                        |
| <b>Subtotal</b>  |                        |                                | 11.387      | 2.137                                      |            | 1.161   |            | 3.349                    |            | -           |            | 3.349            | Continuing       | Continuing | N/A                      |
| Support (\$ in Millions)                               |                        |                                |             | FY 2022                                    |            | FY 2023 |            | FY 2024 Base             |            | FY 2024 OCO |            | FY 2024 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 |
| AN/AQS-20 Engineering Services                         | WR                     | NUWC/NPT : Newport, RI         | 0.365       | 0.000                                      |            | 0.000   |            | 0.000                    |            | -           |            | 0.000            | 0.000            | 0.365      | -                        |
| AN/AQS-20 Engineering Services                         | WR                     | NSWC, PC : Panama City, FL     | 0.501       | 0.140                                      | Oct 2021   | 0.140   | Oct 2022   | 0.468                    | Nov 2023   | -           |            | 0.468            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Engineering Services                         | C/CPFF                 | Raytheon : Portsmouth, RI      | 0.751       | 0.200                                      | Nov 2021   | 0.200   | Nov 2022   | 0.823                    | Nov 2023   | -           |            | 0.823            | Continuing       | Continuing | Continuing               |
| AN/AQS-20 ILS Function                                 | WR                     | NSWC, PC : Panama City, FL     | 1.636       | 0.460                                      | Nov 2021   | 0.144   | Nov 2022   | 0.489                    | Nov 2023   | -           |            | 0.489            | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>  |                        |                                | 3.253       | 0.800                                      |            | 0.484   |            | 1.780                    |            | -           |            | 1.780            | Continuing       | Continuing | N/A                      |

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy** **Date:** March 2023

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| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |
|--|---|---|

| <b>Test and Evaluation (\$ in Millions)</b>                         |                        |                                |             | FY 2022 |            | FY 2023 |            | FY 2024 Base |            | FY 2024 OCO |            | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item  | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E) | WR                     | COTF : Norfolk, VA             | 0.775       | 0.358   | Nov 2021   | 0.038   | Nov 2022   | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E) | WR                     | NSWC, PC : Panama City, FL     | 12.058      | 0.759   | Oct 2021   | 0.225   | Oct 2022   | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E) | C/CPFF                 | Raytheon : Portsmouth, RI      | 2.020       | 0.495   | Nov 2021   | 0.077   | Nov 2022   | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>   |                        |                                | 14.853      | 1.612   |            | 0.340   |            | 0.000        |            | -           |            | 0.000         | Continuing       | Continuing | N/A                      |

**Remarks**  
COTF - Commander Operational Test and Evaluation Force

| <b>Management Services (\$ in Millions)</b> |                        |                                |             | FY 2022 |            | FY 2023 |            | FY 2024 Base |            | FY 2024 OCO |            | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item                          | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| AN/AQS-20 Management Services               | Various                | Various : Various              | 1.842       | 0.172   | Dec 2021   | 0.116   | Dec 2022   | 0.155        | Dec 2023   | -           |            | 0.155         | Continuing       | Continuing | Continuing               |
| AN/AQS-20 Travel                            | Various                | Various : Various              | 0.121       | 0.020   | Mar 2022   | 0.020   | Mar 2023   | 0.389        | Mar 2024   | -           |            | 0.389         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>                             |                        |                                | 1.963       | 0.192   |            | 0.136   |            | 0.544        |            | -           |            | 0.544         | Continuing       | Continuing | N/A                      |

|                            | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |     |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|-----|
| <b>Project Cost Totals</b> |             | 31.456  | 4.741   | 2.121        | 5.673       | -             | 5.673            | Continuing | Continuing               | N/A |

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy** **Date:** March 2023

|  |   |   |
|--|---|---|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |
|--|---|---|

|                                      | FY 2022  |    |    |    | FY 2023 |    |    |    | FY 2024 |    |    |    | FY 2025 |    |    |    | FY 2026 |    |    |    | FY 2027 |    |    |    | FY 2028 |    |    |    |
|--------------------------------------|--|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|---------|----|----|----|
|                                      | 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 |
| <b>Proj 0530</b>                     |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>AN/AQS-20 Program Milestones</b>  |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>AN/AQS-20 Development Phase</b>   |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">IOC<br/>◆</div> </div>  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Blk 2</div> </div>  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Blk 2 ECP Development</div> </div>  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Block 2 Automated Target Recognition (ATR)</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Block 2 Acoustic ID Planning</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>IPMA Development</b>              |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Integration &amp; Test</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Tech Refresh Baseline</div> <div style="border: 1px solid black; padding: 2px;">IPMA Deploy Baseline</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">Tech Refresh Rev 1</div> <div style="border: 1px solid black; padding: 2px;">Tech Refresh Rev 2</div> <div style="border: 1px solid black; padding: 2px;">Tech Refresh Rev 3</div> </div> |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>AN/AQS-20 Test and Evaluation</b> |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">AQS-20/USV IOT&amp;E</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>MCM Mission Package Testing</b>   |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">MCM MP IOT&amp;E</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
| <b>AN/AQS-20 Production</b>          |  |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |
|                                      | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">AQS20A - AQS20C Upgrades</div> <div style="border: 1px solid black; padding: 2px;">AQS-20 Production</div> </div>   |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |         |    |    |    |

2024PB - 0604127N - 0530

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Navy |   | <b>Date:</b> March 2023   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>0530 / <i>Mine Hunt Systems</i> |

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b>Proj 0530</b>   |         |      |         |      |
| AN/AQS-20 Program Milestones: Initial Operational Capability (IOC)   | 2       | 2023 | 2       | 2023 |
| AN/AQS-20 Development Phase: AN/AQS-20 Block 2   | 1       | 2022 | 1       | 2025 |
| AN/AQS-20 Development Phase: AN/AQS-20 Materiel Reliability, Obsolescence, and Performance ECP Development (Block 2) | 1       | 2022 | 4       | 2028 |
| AN/AQS-20 Development Phase: AN/AQS-20 Block 2 Automated Target Recognition (ATR)                                    | 1       | 2022 | 4       | 2024 |
| AN/AQS-20 Development Phase: AN/AQS-20 Block 2 Acoustic Identification Test Planning                                 | 2       | 2023 | 4       | 2023 |
| iPMA Development: iPMA/NSAM Integration and Test   | 1       | 2022 | 2       | 2023 |
| iPMA Development: iPMA Tech Refresh Baseline   | 1       | 2022 | 4       | 2022 |
| iPMA Development: iPMA Deployment Baseline   | 1       | 2023 | 1       | 2024 |
| iPMA Development: Tech Refresh Rev 1   | 1       | 2024 | 4       | 2025 |
| iPMA Development: Tech Refresh Rev 2   | 1       | 2026 | 4       | 2027 |
| iPMA Development: Tech Refresh Rev 3   | 1       | 2028 | 4       | 2028 |
| AN/AQS-20 Test and Evaluation: AN/AQS-20/MCM USV IOT&E   | 4       | 2022 | 4       | 2022 |
| MCM Mission Package Testing: MCM MP IOT&E  | 4       | 2022 | 4       | 2022 |
| AN/AQS-20 Production: AN/AQS20A - AQS20C Upgrades  | 1       | 2022 | 3       | 2024 |
| AN/AQS-20 Production: AQS-20C Production   | 2       | 2025 | 4       | 2028 |

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|--|--------------------|----------------|----------------|---------------------|---|----------------------|----------------|----------------|--|-------------------------|-------------------------|-------------------|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |                    |                |                |                     |   |                      |                |                |  | <b>Date:</b> March 2023 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> |                      |                |                | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |                         |                         |                   |
| <b>COST (\$ in Millions)</b>                                       | <b>Prior Years</b> | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b>  | <b>FY 2024 Total</b> | <b>FY 2025</b> | <b>FY 2026</b> | <b>FY 2027</b>   | <b>FY 2028</b>          | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 1235: <i>Mine Warfare Planning and Analysis</i>                    | 26.101             | 7.183          | 10.838         | 10.454              | -   | 10.454               | 10.261         | 9.249          | 9.360  | 9.547                   | Continuing              | Continuing        |
| Quantity of RDT&E Articles   |                    | -              | -              | -                   | -   | -                    | -              | -              | -  | -                       |                         |                   |

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

The Mine Warfare Planning and Analysis project consists of two projects, the Mine Warfare and Environmental Decision Aids Library (MEDAL) and the Mine Warfare Integrated Synthetic Trainer (MIST). MEDAL is the U.S. Navy's single MIW tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The most recent MEDAL increment, known as MEDAL Enterprise Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning. MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces. MINEnet Global provides downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations. MIST will be a synthetic trainer which will provide training via end-to-end MCM scenarios for MIW staffs. This tool will provide the capability to train MIW staffs against near peer threats.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

|   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <b>Title:</b> Product Development   | 3.599          | 6.173          | 6.108               | 0.000              | 6.108                |
| <b>Articles:</b>  | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b><br>MEDAL:<br>- Conduct Compact Encapsulated Effector (C-ENCAP) FNC with ONR. C-ENCAP will provide advanced minefield planning tools for subsequent integration into MEDAL's Minefield Planning software.<br>- Begin Minefield Planning (MFP) v1.2 software development, which will begin meeting draft Information System-Capability Development Document requirements and begin integrating Compact Encapsulated Effector (C-ENCAP) tools.<br>- Continue MINEnet Tactical (MNT) Modernization software build; versioning updated from MNT v1.4 to MNT v2.0 to align versioning scheme with the planned architecture update. Deliver prototype to Fleet for evaluation as part as Agile software development process. |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <p>- Develop MINEnet Tactical (MNT) v1.3.4, implementing capabilities in accordance with backlog and user feedback; v1.3.4 will add capability to automate Allied Procedural Publication (APP-11) task message preparation.</p> <p>- Conduct annual tactical performance database (TPDB) update to add or refine weapons systems' performance values.</p> <p>MIST:</p> <p>- Complete v0.3 development for scenario generation.</p> <p>- Begin v1.0 end to end integration.</p> <p><b>FY 2024 Base Plans:</b></p> <p>MEDAL:</p> <p>- Complete Minefield Planning (MFP) v1.2 software development, integrating Compact Encapsulated Effector (C-ENCAP) tools and aligning with draft Information System-Capability Development Document as applicable.</p> <p>- Continue MINEnet Tactical (MNT) Modernization software build; versioning updated from MNT v1.4 to MNT v2.0 to align versioning scheme with the planned architecture update. Deliver prototype to Fleet for evaluation as part as Agile software development process.</p> <p>- Begin MINEnet Tactical (MNT) v1.3.5 implementing capabilities in accordance with backlog and user feedback.</p> <p>- Conduct annual tactical performance database (TPDB) update to add or refine weapons systems' performance values.</p> <p>MIST:</p> <p>- Complete v1.0 - end to end integration.</p> <p>- Begin v1.1 - incorporation of user feedback.</p> <p><b>FY 2024 OCO Plans:</b></p> <p>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p> <p>No significant scope changes from FY2023 to FY2024.</p> |                |                |                     |                    |                      |
| <p><b>Title:</b> Engineering Support</p> <p align="right"><b>Articles:</b></p>   | 2.651<br>-     | 3.721<br>-     | 3.229<br>-          | 0.000<br>-         | 3.229<br>-           |
| <p><b>FY 2023 Plans:</b></p> <p>MEDAL:</p>   |                |                |                     |                    |                      |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <p>- Re-evaluate systems engineering analyses to ensure MINEnet Tactical (MNT) v2.0 system architecture will meet requirements.</p> <p>- Adjudicate test observation reports (TORs) from MINEnet Tactical (MNT) v1.3.4 and MNT 2.0 annual prototype and document them as software backlog items.</p> <p>- Conduct systems engineering analysis for Minefield Planning (MFP) v1.2 - integration of Compact Encapsulated Effector (C-ENCAP) tools and Information Systems Capability Development Document (IS-CDD) alignment.</p> <p>- Conduct annual review of Navy training system plan, job-duty task analysis, front-end analysis, and Training Effectiveness Evaluation.</p> <p>- Develop engineering change proposals to maintain hardware and software baselines.</p> <p>- Develop training materials for MINEnet Tactical (MNT) v1.3.4.</p> <p>- Continue providing MEDAL engineering support to LCS MCM Mission Package following their TECHEVAL and IOT&amp;E.</p> <p><b>MIST:</b></p> <p>- Continue assessing cybersecurity requirements and following process to obtain an authority to operate.</p> <p>- Conduct requirements analysis for MIST V1.0 - fully integrated build ready for release. Continue training curriculum development.</p> <p>- Conduct v0.3 release review.</p> <p><b>FY 2024 Base Plans:</b></p> <p><b>MEDAL:</b></p> <p>- Continue systems engineering analysis to ensure MINEnet Tactical (MNT) v2.0 system architecture will meet requirements.</p> <p>- Conduct systems engineering analysis for MFP v1.2 - integration of Compact Encapsulated Effector (C-ENCAP) tools and Information Systems Capability Development Document (IS-CDD) alignment.</p> <p>- Conduct requirements analysis for MINEnet Tactical (MNT) v1.3.5.</p> <p>- Adjudicate test observation reports (TORs) from MINEnet Tactical (MNT) 2.0 annual prototype and document them as software backlog items.</p> <p>- Conduct annual review of Navy training system plan, job-duty task analysis, front-end analysis, and training effectiveness evaluation.</p> <p>- Develop engineering change proposals to maintain hardware and software baselines.</p> |                |                |                     |                    |                      |

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|--|---|--|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p>MIST:</p> <ul style="list-style-type: none"> <li>- Continue assessing cybersecurity requirements and following process to obtain an authority to operate.</li> <li>- Conduct requirements analysis for MIST v1.1.</li> <li>- Complete training curriculum development.</li> <li>- Conduct v1.0 release review.</li> </ul> <p><b>FY 2024 OCO Plans:</b><br/>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b><br/>No significant scope changes from FY2023 to FY2024.</p>   |                |                |                     |                    |                      |
| <p><b>Title:</b> Test and Evaluation</p> <p align="right"><b>Articles:</b></p>  | 0.306          | 0.365          | 0.465               | 0.000              | 0.465                |
| <p><b>FY 2023 Plans:</b></p> <p>MEDAL:</p> <ul style="list-style-type: none"> <li>- Update MEDAL Test and Evaluation Master Plan to address comments and feedback from stakeholders in preparation for Milestone B.</li> <li>- Conduct MINEnet Tactical (MNT) v1.3.4 test.</li> <li>- Evaluate MINEnet Tactical (MNT) v2.0 prototype.</li> </ul> <p>MIST:</p> <ul style="list-style-type: none"> <li>- Conduct v0.3 prototype assessment.</li> </ul> <p><b>FY 2024 Base Plans:</b></p> <p>MEDAL:</p> <ul style="list-style-type: none"> <li>- Evaluate MINEnet Tactical (MNT) v2.0 prototype.</li> </ul> <p>MIST:</p> <ul style="list-style-type: none"> <li>- Begin MIST v1.0 developmental testing program.</li> </ul> <p><b>FY 2024 OCO Plans:</b><br/>N/A</p> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b></p> | -              | -              | -                   | -                  | -                    |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>                                   | <b>FY 2022</b> | <b>FY 2023</b> | <b>FY 2024 Base</b> | <b>FY 2024 OCO</b> | <b>FY 2024 Total</b> |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| FY2023 to FY2024 decrease associated with completion of MINEnet Tactical (MNT) v1.3.4 testing in FY2023.                  |                |                |                     |                    |                      |
| <b>Title:</b> Management Services   | 0.627          | 0.579          | 0.652               | 0.000              | 0.652                |
| <b>Articles:</b>  | -              | -              | -                   | -                  | -                    |
| <b>FY 2023 Plans:</b>   |                |                |                     |                    |                      |
| MEDAL:  |                |                |                     |                    |                      |
| - Continue to plan, track, follow-up and report on cost, schedule, and performance status.                                |                |                |                     |                    |                      |
| - Conduct oversight of project technical processes.   |                |                |                     |                    |                      |
| - Develop cross-functional plans to meet draft Information Systems Capability Development Document (IS-CDD) requirements. |                |                |                     |                    |                      |
| MIST:   |                |                |                     |                    |                      |
| - Continue to plan, track, follow-up and report on cost, schedule, and performance status.                                |                |                |                     |                    |                      |
| <b>FY 2024 Base Plans:</b>  |                |                |                     |                    |                      |
| MEDAL:  |                |                |                     |                    |                      |
| - Continue to plan, track, follow-up and report on cost, schedule, and performance status.                                |                |                |                     |                    |                      |
| - Conduct oversight of project technical processes.   |                |                |                     |                    |                      |
| - Conduct Milestone B and address actions following the Milestone B review.   |                |                |                     |                    |                      |
| MIST:   |                |                |                     |                    |                      |
| - Continue to plan, track, follow-up and report on cost, schedule, and performance status.                                |                |                |                     |                    |                      |
| <b>FY 2024 OCO Plans:</b>   |                |                |                     |                    |                      |
| N/A   |                |                |                     |                    |                      |
| <b>FY 2023 to FY 2024 Increase/Decrease Statement:</b>  |                |                |                     |                    |                      |
| No significant scope changes from FY2023 to FY2024.   |                |                |                     |                    |                      |
| <b>Accomplishments/Planned Programs Subtotals</b>   | 7.183          | 10.838         | 10.454              | 0.000              | 10.454               |

|  |
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| <b>C. Other Program Funding Summary (\$ in Millions)</b> |
| N/A  |
| <b>Remarks</b>   |
|  |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

**D. Acquisition Strategy**

The MEDAL program is government led and executed. NSWC PCD is the lead government activity, and awarded a Seaport engineering services contract to Innovative Professional Solutions (IPS) in FY 2020 to provide additional engineering capacity across disciplines.

MIST is a government product designed, developed and supported at NSWC PCD.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy |                        |                                    |             |  |            |         |            |   |            |             |            | Date: March 2023 |                  |            |                          |
|--|------------------------|------------------------------------|-------------|--|------------|---------|------------|---|------------|-------------|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity                          |                        |                                    |             | R-1 Program Element (Number/Name)          |            |         |            | Project (Number/Name)                     |            |             |            |                  |                  |            |                          |
| 1319 / 4   |                        |                                    |             | PE 0604127N / Surface Mine Countermeasures |            |         |            | 1235 / Mine Warfare Planning and Analysis |            |             |            |                  |                  |            |                          |
| Product Development (\$ in Millions)                   |                        |                                    |             | FY 2022                                    |            | FY 2023 |            | FY 2024 Base                              |            | FY 2024 OCO |            | FY 2024 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 |
| MEDAL EA   | C/IDDQ                 | IPS : Panama City, FL              | 0.316       | 0.664                                      | Jun 2022   | 0.145   | Jun 2023   | 0.681                                     | Jun 2024   | -           |            | 0.681            | Continuing       | Continuing | Continuing               |
| MEDAL EA & MIW Integrated Synthetic Training (MIST)    | WR                     | NSWC PCD : Panama City FL          | 8.972       | 2.935                                      | Oct 2021   | 4.214   | Oct 2022   | 5.427                                     | Oct 2023   | -           |            | 5.427            | Continuing       | Continuing | Continuing               |
| MEDAL EA & MIW Integrated Synthetic Training (MIST)    | WR                     | Office of Naval Research : Various | 0.000       | 0.000                                      |            | 1.814   | Oct 2022   | 0.000                                     | Oct 2023   | -           |            | 0.000            | 0.000            | 1.814      | 1.814                    |
| <b>Subtotal</b>  |                        |                                    | 9.288       | 3.599                                      |            | 6.173   |            | 6.108                                     |            | -           |            | 6.108            | Continuing       | Continuing | N/A                      |
| Support (\$ in Millions)                               |                        |                                    |             | FY 2022                                    |            | FY 2023 |            | FY 2024 Base                              |            | FY 2024 OCO |            | FY 2024 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 |
| MEDAL EA & MIW Integrated Synthetic Training (MIST)    | WR                     | NSWC PC : Panama City FL           | 11.694      | 2.528                                      | Oct 2021   | 3.026   | Oct 2022   | 2.950                                     | Oct 2023   | -           |            | 2.950            | Continuing       | Continuing | Continuing               |
| MEDAL EA   | C/IDDQ                 | IPS : Panama City FL               | 1.097       | 0.123                                      | Jun 2022   | 0.695   | Jun 2023   | 0.279                                     | Jun 2024   | -           |            | 0.279            | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>  |                        |                                    | 12.791      | 2.651                                      |            | 3.721   |            | 3.229                                     |            | -           |            | 3.229            | Continuing       | Continuing | N/A                      |
| Test and Evaluation (\$ in Millions)                   |                        |                                    |             | FY 2022                                    |            | FY 2023 |            | FY 2024 Base                              |            | FY 2024 OCO |            | FY 2024 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 |
| Developmental Test & Evaluation (DT&E)                 | WR                     | NSWC PCD : Panama City, FL         | 1.345       | 0.158                                      | Oct 2021   | 0.331   | Oct 2022   | 0.432                                     | Oct 2023   | -           |            | 0.432            | Continuing       | Continuing | Continuing               |
| Developmental Test & Evaluation (DT&E)                 | C/IDDQ                 | IPS : Panama City, FL              | 0.526       | 0.148                                      | Jun 2022   | 0.034   | Jun 2023   | 0.033                                     | Jun 2024   | -           |            | 0.033            | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>  |                        |                                    | 1.871       | 0.306                                      |            | 0.365   |            | 0.465                                     |            | -           |            | 0.465            | Continuing       | Continuing | N/A                      |



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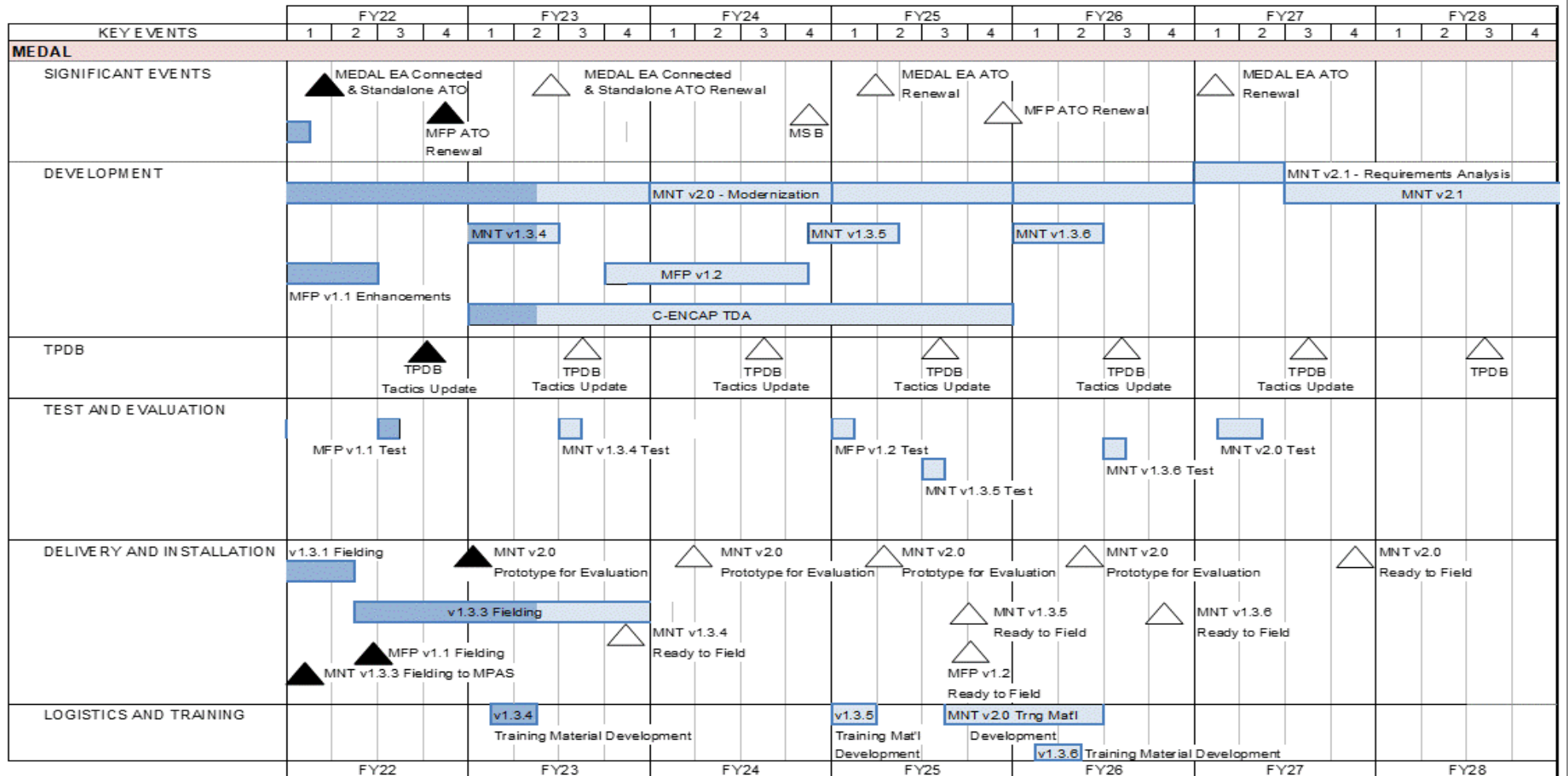
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity  
1319 / 4

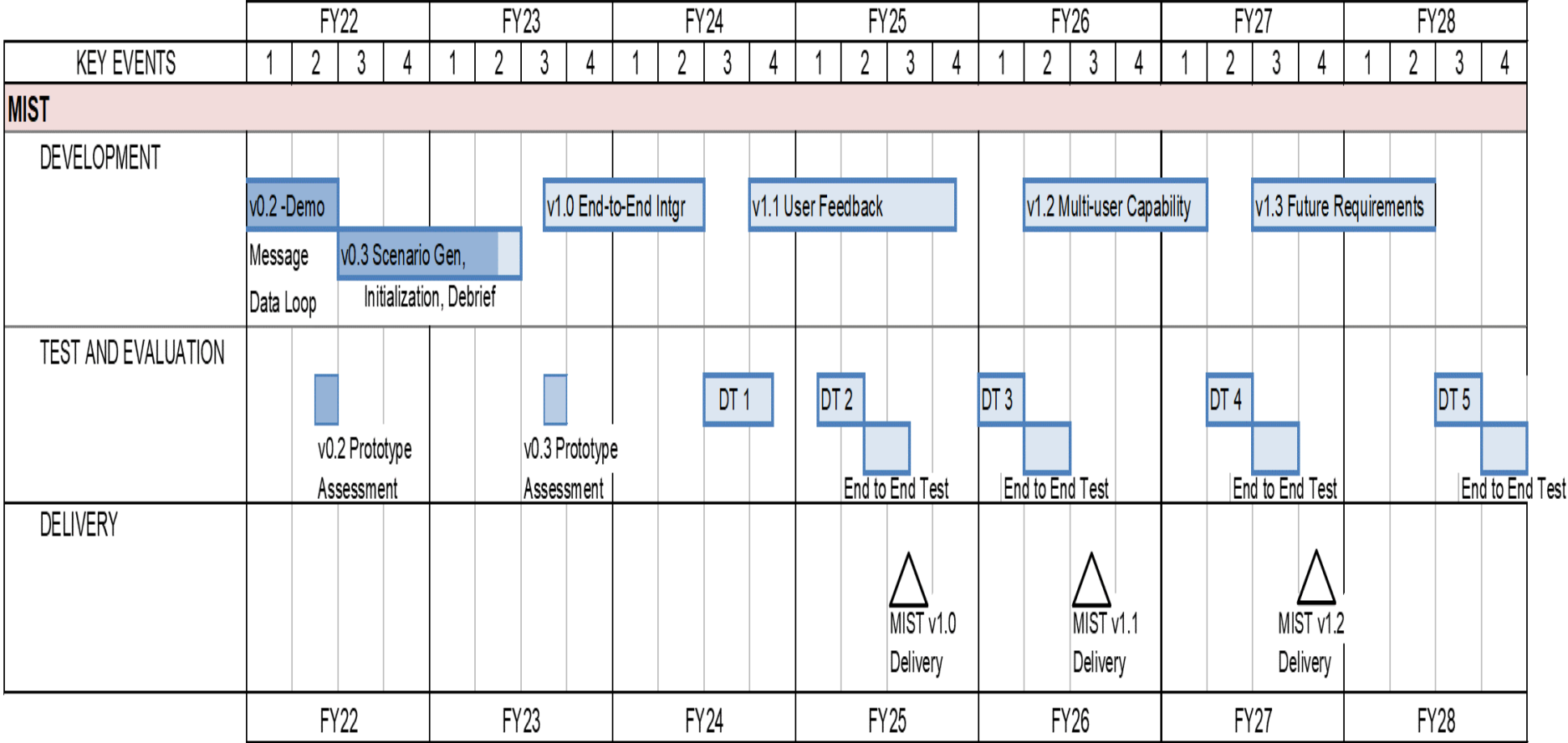
R-1 Program Element (Number/Name)  
PE 0604127N / Surface Mine Countermeasures

Project (Number/Name)  
1235 / Mine Warfare Planning and Analysis



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| <b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2024 Navy</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <b>Date: March 2023</b>   |  |  |  |  |  |  |  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4             |  |  |  |  |  |  |  |  |  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / Surface Mine Countermeasures |  |  |  |  |  | <b>Project (Number/Name)</b><br>1235 / Mine Warfare Planning and Analysis |  |  |  |  |  |  |  |



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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2024 Navy |   | <b>Date:</b> March 2023  |
| <b>Appropriation/Budget Activity</b><br>1319 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |

Schedule Details

| Events by Sub Project   | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| <b>MEDAL</b>  |         |      |         |      |
| Significant Events: MEDAL EA Connected & Standalone ATO   | 1       | 2022 | 1       | 2022 |
| Significant Events: Milestone B   | 4       | 2024 | 4       | 2024 |
| Significant Events: MFP ATO Renewal   | 4       | 2022 | 4       | 2022 |
| Significant Events: MEDAL EA Connected & Standalone ATO Renewal   | 2       | 2023 | 2       | 2023 |
| Significant Events: MFP ATO Renewal 2   | 4       | 2025 | 4       | 2025 |
| Significant Events: MFP ATO Renewal 3   | 4       | 2028 | 4       | 2028 |
| Significant Events: MEDAL EA Connected & Standalone ATO Renewal 2   | 1       | 2025 | 1       | 2025 |
| Significant Events: MEDAL EA Connected & Standalone ATO Renewal 3   | 1       | 2028 | 1       | 2028 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.0 Modernization         | 1       | 2022 | 4       | 2026 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.1 Requirements Analysis | 1       | 2027 | 2       | 2027 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.1                       | 3       | 2027 | 4       | 2028 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.4                     | 1       | 2023 | 2       | 2023 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.5                     | 4       | 2024 | 2       | 2025 |
| System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.6                     | 1       | 2026 | 2       | 2026 |
| System Development: MEDAL EA Development: MEDAL EA Development: Minefield Planning v1.1 (MFP) Enhancements  | 1       | 2022 | 2       | 2022 |

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Navy **Date:** March 2023

|  |   |  |
|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |
|--|---|--|

| Events by Sub Project   | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| System Development: MEDAL EA Development: MEDAL EA Development: Minefield Planning v1.2 (MFP) Development   | 4       | 2023 | 4       | 2024 |
| System Development: MEDAL EA Development: C-ENCAP TDA   | 1       | 2023 | 4       | 2025 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: Minefield Planning v1.1 (MFP) Test                         | 3       | 2022 | 3       | 2022 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.4 (MNT) Test                         | 3       | 2023 | 3       | 2023 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: Minefield Planning v1.2 (MFP) Test                         | 1       | 2025 | 1       | 2025 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.5 (MNT) Test                         | 3       | 2025 | 3       | 2025 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.6 (MNT) Test                         | 3       | 2026 | 3       | 2026 |
| Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v2.0 (MNT) Test                           | 1       | 2027 | 2       | 2027 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v1.3.1 Fielding                 | 1       | 2022 | 2       | 2022 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v1.3.3 Fielding to MPAS         | 1       | 2022 | 1       | 2022 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v1.3.3 Fielding                 | 2       | 2022 | 4       | 2022 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP v1.1 Fielding                                | 4       | 2022 | 1       | 2023 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v2.0 Prototype for Evaluation   | 1       | 2023 | 1       | 2023 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v2.0 Prototype for Evaluation 2 | 2       | 2024 | 2       | 2024 |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINEnet Tactical v2.0 Prototype for Evaluation 3 | 2       | 2025 | 2       | 2025 |

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2024 Navy **Date:** March 2023

|  |   |  |
|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |
|--|---|--|

| <b>Events by Sub Project</b>  | <b>Start</b>   |             | <b>End</b>     |             |
|---|----------------|-------------|----------------|-------------|
|   | <b>Quarter</b> | <b>Year</b> | <b>Quarter</b> | <b>Year</b> |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Prototype for Evaluation 4 | 2              | 2026        | 2              | 2026        |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Ready to Field             | 4              | 2027        | 4              | 2027        |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.4 Ready to Field           | 4              | 2023        | 4              | 2023        |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.5 Ready to Field           | 4              | 2025        | 4              | 2025        |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP v1.2 Ready to Fielding                       | 4              | 2025        | 4              | 2025        |
| Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.6 Ready to Field           | 4              | 2026        | 4              | 2026        |
| TBDP: Incremental TPDB Tactics Updates  | 1              | 2022        | 4              | 2028        |
| LOGISTICS AND TRAINING: Training Material Development v1.3.4  | 1              | 2023        | 2              | 2023        |
| LOGISTICS AND TRAINING: Training Material Development v1.3.5  | 1              | 2025        | 1              | 2025        |
| LOGISTICS AND TRAINING: Training Material Development v1.3.6  | 1              | 2026        | 2              | 2026        |
| LOGISTICS AND TRAINING: MINENet Tactical v2.0 Training Material Development                                 | 3              | 2025        | 2              | 2026        |
| <b>MIW Integrated Synthetic Training (MIST)</b>   |                |             |                |             |
| System Development: MIST Development: Development v0.2  | 1              | 2022        | 2              | 2022        |
| System Development: MIST Development: Development v0.3  | 3              | 2022        | 2              | 2023        |
| System Development: MIST Development: Development v1.0  | 3              | 2023        | 2              | 2024        |
| System Development: MIST Development: Development v1.1  | 4              | 2024        | 4              | 2025        |
| System Development: MIST Development: Development v1.2  | 2              | 2026        | 1              | 2027        |
| System Development: MIST Development: Development v1.3  | 3              | 2027        | 2              | 2028        |
| Test & Evaluation: MIST T&E: v0.2 Fleet Prototype Assessment  | 2              | 2022        | 2              | 2022        |
| Test & Evaluation: MIST T&E: v0.3 Fleet Prototype Assessment  | 3              | 2023        | 3              | 2023        |
| Test & Evaluation: MIST T&E: v1.0 Developmental Test 1  | 3              | 2024        | 4              | 2024        |

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**Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy** **Date:** March 2023

|  |   |  |
|--|---|--|
| <b>Appropriation/Budget Activity</b><br>1319 / 4 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604127N / <i>Surface Mine Countermeasures</i> | <b>Project (Number/Name)</b><br>1235 / <i>Mine Warfare Planning and Analysis</i> |
|--|---|--|

| <b>Events by Sub Project</b>                           | <b>Start</b>   |             | <b>End</b>     |             |
|--|----------------|-------------|----------------|-------------|
|  | <b>Quarter</b> | <b>Year</b> | <b>Quarter</b> | <b>Year</b> |
| Test & Evaluation: MIST T&E: v1.0 Developmental Test 2 | 1              | 2025        | 2              | 2025        |
| Test & Evaluation: MIST T&E: v1.1 Developmental Test 3 | 1              | 2026        | 1              | 2026        |
| Test & Evaluation: MIST T&E: v1.2 Developmental Test 4 | 2              | 2027        | 2              | 2027        |
| Test & Evaluation: MIST T&E: v1.3 Developmental Test 5 | 3              | 2028        | 3              | 2028        |
| Test & Evaluation: MIST T&E: v1.0 End to End Test 1    | 2              | 2025        | 3              | 2025        |
| Test & Evaluation: MIST T&E: v1.1 End to End Test 2    | 2              | 2026        | 2              | 2026        |
| Test & Evaluation: MIST T&E: v1.2 End to End Test 3    | 3              | 2027        | 3              | 2027        |
| Test & Evaluation: MIST T&E: v1.3 End to End Test 4    | 4              | 2028        | 4              | 2028        |
| Delivery Milestones: MIST Fielding: v1.0 Delivery      | 3              | 2025        | 3              | 2025        |
| Delivery Milestones: MIST Fielding: v1.1 Delivery      | 3              | 2026        | 3              | 2026        |
| Delivery Milestones: MIST Fielding: v1.2 Delivery      | 4              | 2027        | 4              | 2027        |