

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy **Date:** March 2024

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| Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> |
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| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|----------------------------------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 736.122 | 131.705 | 229.668 | 137.265 | - | 137.265 | 112.503 | 65.991 | 76.359 | 71.311 | Continuing | Continuing |
| 1412: <i>HAAWC</i> | 20.067 | 2.715 | 18.340 | 0.000 | - | 0.000 | 19.061 | 15.367 | 16.141 | 9.927 | Continuing | Continuing |
| 2234: <i>Lightweight Hybrid Torpedo</i> | 424.987 | 12.195 | 13.997 | 13.441 | - | 13.441 | 15.358 | 15.285 | 14.881 | 15.167 | Continuing | Continuing |
| 3418: <i>Advanced Anti-Submarine Lightweight Torpedo</i> | 291.068 | 116.795 | 197.331 | 123.824 | - | 123.824 | 78.084 | 35.339 | 45.337 | 46.217 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

The Lightweight Torpedo (LWT) program designs, integrates and tests the MK 54 LWT and supports an incremental developmental acquisition approach combining hardware and Advanced Processor Build (APB) software upgrades to enable rapid fielding of improvements to the fleet. The program will focus on common LWT and Heavyweight Torpedo (HWT) hardware and software architecture enhancements that will provide improvements to the array, warhead, propulsion, and APB software to address capability gaps against challenging adversary submarines and environments. Future APB software builds will utilize common torpedo software to deliver capability and tactics improvements to the MK 54 LWT. The program will also support development of enhanced weapon delivery methods, including the high altitude launch of the MK 54 from the P-8A Maritime Patrol and Reconnaissance Aircraft (MPRA) with the HAAWC Air Launch Accessory (ALA) and development of a common HAAWC capability compatible with the MK 54 MOD 2 Advanced LWT (ALWT).

The HAAWC development program provides the P-8A MPRA with the ability to release LWTs from high altitude to prosecute enemy submarine threats. Operational Testing (OT) was conducted at the end of FY 2020, and the Commander Operational Test & Evaluation Force (COMOPTEVFOR) report was issued in FY 2021, recommending fielding. Follow-on T&E (FOT&E) was conducted in FY 2022 with updated flight control software and the program delivered the HAAWC capability to the fleet in Q3 FY 2022 with Commander Patrol and Reconnaissance Group (CPRG) declaring Initial Operating Capability (IOC) in Q1 FY 2023. The current HAAWC design was developed to deploy the MK 54 MOD 0/1. The MK 54 MOD 2 is not compatible with HAAWC due to having different mass properties and outer mold line from the MK 54 MOD 0/1 LWT. The HAAWC development program will focus on development of a new HAAWC design, starting in FY 2024, that will be compatible, at a minimum, with the MK 54 MOD 2 ALWT, aligned with the MK 54 MOD 2 fleet delivery schedule and investigate the potential for a common HAAWC design for all MK 54 MODs.

The MK 54 MOD 1 provides significant performance improvements compared to MK 54 MOD 0 for challenging littoral, shallow water environments and adversary countermeasures. The MOD 1 program is split into 2 increments: Increment 1 focusing on the updated sonar hardware and associated APB 5 common software to provide an improved LWT to the Fleet to replace the MK 54 MOD 0s; Increment 2 is the APB 6 software (SW) only upgrade to fully take advantage of the improved sonar hardware developed under Increment 1, update the platform interface to reduce Fleet Operator workload, and provide new potential capabilities such as Salvo and terminal homing improvements. APB 6 will run on MOD 1 but also serves as the SW baseline for the MK 54 MOD 2 and the MOD 2 program will leverage development and testing under the MOD 1 Increment 2 program to reduce the scope of the test and evaluation required for the MOD 2.

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| Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> |
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The MK 54 MOD 2 improves the lethality and speed of the LWT by upgrading the Warhead and Propulsion system to counter challenging near-peer adversary submarines that are faster and deeper diving, leveraging the sonar hardware improvements developed under the MOD 1 program. The program awarded four Other Transaction Authority (OTA) agreements to industry partners in FY 2020 for the Proof of Design (POD) of the Guidance and Control (G&C) section, Warhead, Stored Chemical Energy Propulsion System (SCEPS) afterbody sections, and All Up Round (AUR) system integrator. Industry partners are focused primarily on the development of torpedo hardware and support equipment while the USN maintains the responsibility of developing the software under the APB process and will develop specific software modules for the MK 54 MOD 2 variant. To make the program more affordable in the Proof of Manufacture (POM) Phase while still delivering necessary capability to the Fleet, the program has restructured to an incremental approach, first focused on delivering the lethality required for the intended threats. In the first increment, the program is prioritizing the G&C and Warhead development and their integration with existing LWT Otto fuel propulsion section. Increment 2 will complete the development and integration of the capability delivered by the SCEPS section and meet the full requirements defined by the Capability Development Document (CDD). Each increment will have its own test and evaluation phase and IOC. Increment 1 is focused on meeting the lethality requirements at its IOC and Increment 2 is expected to meet the full set of system requirements (as defined in the CDD) at its IOC. The program intends to award a competitive OTA in FY 2024 to a single AUR Industry partner. The winner of the OTA will complete POM of the Increment 1 AUR and procure up to the equivalent of 48 POM AUR test assets to be used in the Increment 1 Developmental and Operational Test and Evaluations. The winner of the Increment 1 OTA will be responsible for managing the subsystem and system level qualification, AUR assembly, and platform integration. Increment 2 will be competed and awarded in FY2030 and will be expected to complete development and integration of the Increment 2 AUR and procurement of POM AUR test assets to be used for the Increment 2 Developmental and Operational Test and Evaluations.

| B. Program Change Summary (\$ in Millions) | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|---------------------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 135.500 | 229.668 | 224.086 | - | 224.086 |
| Current President's Budget | 131.705 | 229.668 | 137.265 | - | 137.265 |
| Total Adjustments | -3.795 | 0.000 | -86.821 | - | -86.821 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -3.795 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -86.649 | - | -86.649 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -0.172 | - | -0.172 |

Change Summary Explanation

FY 2023 funding request was adjusted by (\$3.795M) due to SBIR/STTR realignment.

FY 2025 total decrease of \$86.821M is due to a reduction in the MK 54 MOD 2 development technical approach, a reduction in Phase II hardware development, and minor rate adjustments.

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy **Date:** March 2024

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|--------------------------------------------------|--------------------|----------------|----------------|---------------------|--------------------------------------------------------------------------------------------------|----------------------|----------------|----------------|----------------------------------------------|----------------|-------------------------|-------------------|
| Appropriation/Budget Activity 1319 / 5 | | | | | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | Project (Number/Name) 1412 / HAAWC | | | |
| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| 1412: HAAWC | 20.067 | 2.715 | 18.340 | 0.000 | - | 0.000 | 19.061 | 15.367 | 16.141 | 9.927 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The program will design, develop, and procure a High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC) Air Launch Accessory (ALA) for the MK 54 MOD 2 Lightweight Torpedo (LWT). This capability will allow fixed-wing employment of the MK 54 MOD 2 torpedo in the same manner as the HAAWC allows for the MK 54 MOD 0/1 Torpedoes: at high altitude, with stand-off ranges, and the ability for precision guidance to the intended water entry point (WEP) without affecting the in-water operation of the torpedo. The HAAWC program will focus on development of a HAAWC that will be compatible with the MK 54 MOD 2 ALWT, aligned with the MK 54 MOD 2 fleet delivery schedule. The program will investigate the potential for a common HAAWC design for all MK 54 MODs.

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

| | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| Title: High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC) Development | 2.715 | 18.340 | 0.000 | 0.000 | 0.000 |
| Articles: | - | - | - | - | - |
| FY 2024 Plans: -Continue HAAWC for MOD 2 Development. -Solicit Proposals and complete evaluation(s) for Award of development contract for HAAWC for MOD 2. -Conduct Systems Requirement Review (SRR). | | | | | |
| FY 2025 Base Plans: N/A | | | | | |
| FY 2025 OCO Plans: N/A | | | | | |
| FY 2024 to FY 2025 Increase/Decrease Statement: Decreased funding from FY24 to FY25 by (\$18.340M) due to adjustments in the MK 54 MOD 2 development technical approach. | | | | | |
| Accomplishments/Planned Programs Subtotals | 2.715 | 18.340 | 0.000 | 0.000 | 0.000 |

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

| Line Item | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
|--------------------------------|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • WPN/3215: MK-54 Torpedo Mods | 103.367 | 104.086 | 106.249 | - | 106.249 | 136.313 | 138.019 | 141.040 | 143.879 | Continuing | Continuing |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 1412 / HAAWC |

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

| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> <u>Base</u> | <u>FY 2025</u> <u>OCO</u> | <u>FY 2025</u> <u>Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
|------------------|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|

Remarks

LI 3215 FYDP funds MK 54 MOD 0, MK 54 MOD 1, MK 54 MOD 2, and HAAWC procurements.

D. Acquisition Strategy

The Engineering and Manufacturing Development (EMD) contract was completed by Boeing Company supports an incremental approach to delivering full HAAWC capability, Air Launch Accessory (ALA) assets and equipment, as well as associated engineering services and support. HAAWC compatible with MK 54 MOD 0/1 is in full rate production in a sole source follow on award to Boeing. The MK 54 MOD 2 compatible HAAWC developmental contract award is planned for FY 2026 based on technical studies and market research activities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 1412 / HAAWC |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------|

| Product Development (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |
| Hardware Development - HAAWC | C/CPFF | Boeing : St. Louis, MO | 6.848 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.848 | - |
| Hardware Development - HAAWC | WR | NSWC : Indian Head, MD | 0.040 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.040 | - |
| Hardware Development - HAAWC | WR | NSWC : Carderock, md | 0.015 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.015 | - |
| Hardware Development - HAAWC | WR | NUWC : Newport, RI | 0.306 | 0.989 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.295 | - |
| Hardware Development - HAAWC | WR | NUWC : Keyport, WA | 0.000 | 0.997 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.997 | - |
| Systems Engineering - HAAWC | WR | NAWC : Pax River, MD | 1.226 | 0.544 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.770 | - |
| Systems Engineering - HAAWC | WR | NAWC : China Lake, CA | 0.740 | 0.185 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.925 | - |
| Hardware Development - HAAWC for MK 54 MOD 2 | C/CPFF | Contractor TBD : Location TBD | 0.000 | 0.000 | | 15.598 | Jun 2024 | 0.000 | | - | | 0.000 | 0.000 | 15.598 | - |
| Hardware Development - HAAWC for MK 54 MOD 2 | WR | NUWC : Newport, RI | 0.000 | 0.000 | | 1.000 | Nov 2023 | 0.000 | | - | | 0.000 | 0.000 | 1.000 | - |
| Hardware Development - HAAWC for MK 54 MOD 2 | WR | NUWC : Keyport, WA | 0.000 | 0.000 | | 1.000 | Nov 2023 | 0.000 | | - | | 0.000 | 0.000 | 1.000 | - |
| Hardware Development - HAAWC for MK 54 MOD 2 | C/BA | NAWC : Pax River / China Lake | 0.000 | 0.000 | | 0.742 | Nov 2023 | 0.000 | | - | | 0.000 | 0.000 | 0.742 | - |
| Subtotal | | | 9.175 | 2.715 | | 18.340 | | 0.000 | | - | | 0.000 | 0.000 | 30.230 | N/A |

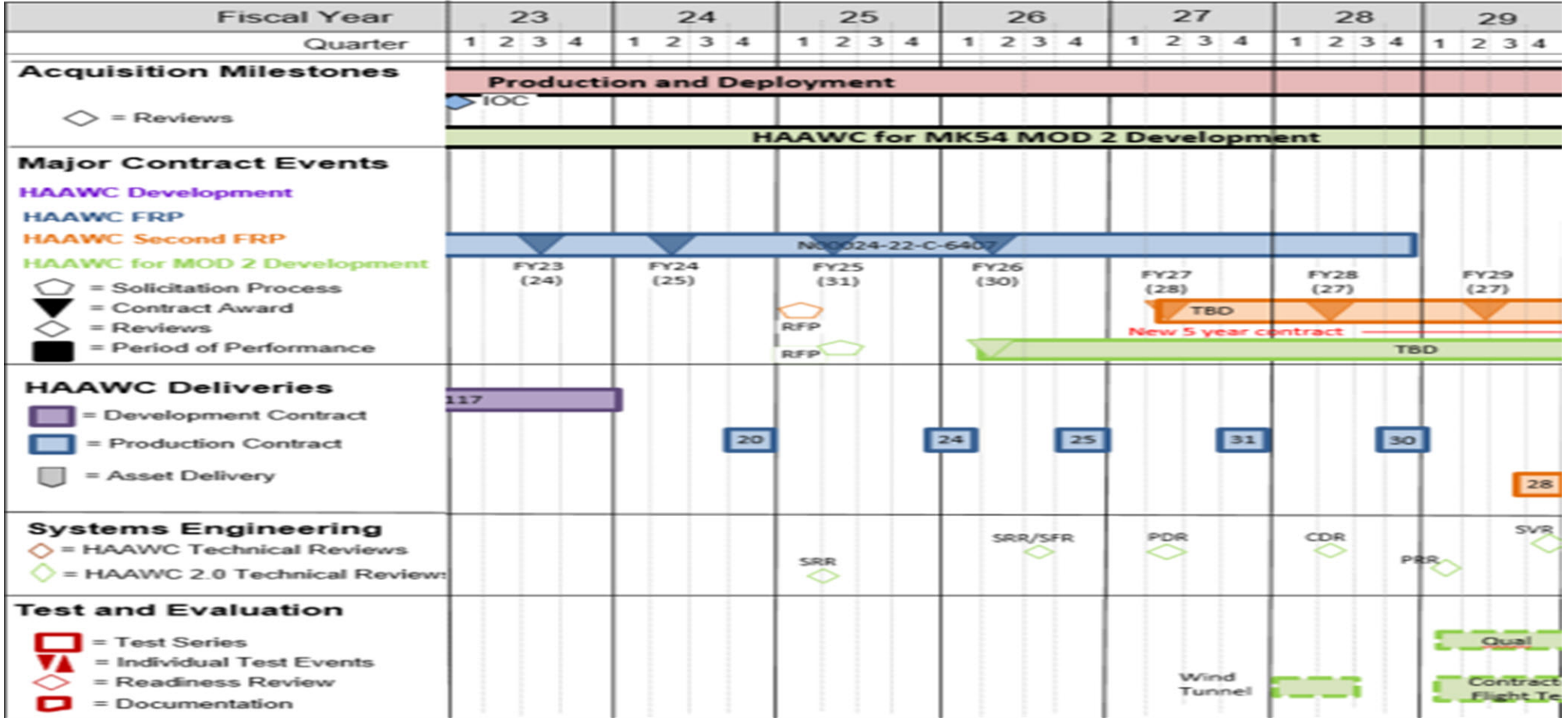
Remarks
Decreased funding in FY 2025 for HAAWC due to adjustments in the MK 54 MOD 2 development technical approach.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy | | | | | | | | | | | | Date: March 2024 | | | |
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| Appropriation/Budget Activity | | | | R-1 Program Element (Number/Name) | | | | Project (Number/Name) | | | | | | | |
| 1319 / 5 | | | | PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | 1412 / HAAWC | | | | | | | |
| Support (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 Management Support - HAAWC | WR | NUWC : Keyport, WA | 1.373 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Subtotal | | | 1.373 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | N/A |
| Test and Evaluation (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 Operational Test & Evaluation Not Funded FYDP (PYOT&E) | C/CPFF | Boeing : St. Louis, MO | 4.124 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.124 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NUWC : Keyport, WA | 1.058 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.058 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NUWC : Newport, RI | 1.488 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.488 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NAWC : China Lake, CA | 0.425 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.425 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NAWC : Pax River, MD | 0.825 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.825 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | OPTEVFOR : Norfolk, VA | 1.504 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.504 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NAVAIR : China Lake, CA | 0.025 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.025 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NSWC : Indian Head, MD | 0.070 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.070 | - |
| Subtotal | | | 9.519 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.519 | N/A |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 1412 / HAAWC |

MK 54 HAAWC Acquisition Schedule



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| Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 1412 / HAAWC |

Schedule Details

| Events by Sub Project | Start | | End | |
|--------------------------------------------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Proj 1412 | | | | |
| HAAWC Design/Development/Qualification: HAAWC on MK 54 MOD 2 Development | 1 | 2023 | 4 | 2029 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | | | | | | | | | | Date: March 2024 | | |
| Appropriation/Budget Activity 1319 / 5 | | | | | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> | | |
| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| 2234: <i>Lightweight Hybrid Torpedo</i> | 424.987 | 12.195 | 13.997 | 13.441 | - | 13.441 | 15.358 | 15.285 | 14.881 | 15.167 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The program designs, integrates and tests the LWT MK 54. The LWT provides performance improvements in shallow water, counter-measure environments. The MK 54 MOD 1 program consists of two increments: (1) Increment 1 consisting of Advanced Processor Build (APB) 5 / Tech Insertion 1 (TI-1); and (2) Increment 2, consisting of APB-6 software upgrade.

FY 2025 funding is for continued development of MK 54 MOD 1 Increment 2 APB 6 developmental builds, conducting in-water developmental test runs, and Weapons Analysis Facility (WAF) system testing. FY 2025 funding also for continued development of a Fleet Exercise Section (FES) instrumentation subsystem to be compatible with the MK 54 MOD 1 obsolescence upgraded hardware being produced under BLI 3215.

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

| | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|----------------------------------------------------------------------------------------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| Title: MK 54 Pre-Planned Product Improvement | 12.195 | 13.997 | 13.441 | 0.000 | 13.441 |
| Articles: | - | - | - | - | - |
| FY 2024 Plans: | | | | | |
| -Continue Fleet Exercise Section (FES) development. | | | | | |
| -Continue Environmentally Centric Weapons Facility (EC WAF) Integration Continue APB 6 (INC 2) software development. | | | | | |
| -Conduct Engineering In Water Testing for APB 6 (INC 2). | | | | | |
| -Initiated Developmental Testing for APB 6 (INC 2). | | | | | |
| -Conduct initial platform integration of APB 6 (INC 2) with launch platforms (P-8A, MH-60R, CRUDES). | | | | | |
| FY 2025 Base Plans: | | | | | |
| -Continue Fleet Exercise Section (FES) development. | | | | | |
| -Continue Environmentally Centric Weapons Facility (EC WAF) Integration Continue APB 6 (INC 2) software development. | | | | | |
| -Continue Developmental Testing for APB 6 (INC 2). | | | | | |
| -Continue platform integration of APB 6 (INC 2) with launch platforms (P-8A, MH-60R, CRUDES). | | | | | |
| FY 2025 OCO Plans: | | | | | |

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |
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| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|--------------|-------------|---------------|
| N/A | | | | | |
| <i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Decreased funding from FY24 to FY25 by (\$0.556M) due to reduced APB 6 software development efforts. | | | | | |
| Accomplishments/Planned Programs Subtotals | 12.195 | 13.997 | 13.441 | 0.000 | 13.441 |

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

| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025 Base</u> | <u>FY 2025 OCO</u> | <u>FY 2025 Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
|---------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • WPN/3215: <i>MK-54 Torpedo Mods</i> | 103.367 | 104.086 | 106.249 | - | 106.249 | 136.313 | 138.019 | 141.040 | 143.879 | Continuing | Continuing |

Remarks
LI 3215 FYDP funds MK 54 MOD 0, MK 54 MOD 1, MK 54 MOD 2 and HAAWC procurements.

D. Acquisition Strategy
Leveraging a Phase III SBIR, a MK 54 MOD 1 LRIP contract was awarded to Progeny in 2016, for the delivery of MOD 1 assets to support Operational Testing (OT). OT was considered complete and COTF declared end of test in Oct 2022, however, DOT&E considers the amount of in-water testing insufficient to be able to determine whether the MOD 1 is operationally suitable and effective. EOC approved by MDA in Dec 2021 and IOC approved by the MDA in Apr 2023. Continuing on with the SBIR contractor, a second LRIP contract was awarded to Progeny for MOD 1 kits in 2018, with an option for Full Rate Production in FY 2022. A new Sole Source FRP contract award is planned for 4Q FY 2023 and will incorporate the completion of the development and qualification of the FES that is compatible with the obsolescence upgrade that is being produced in the second LRIP contract and subsequent FRP contract(s). In conjunction with these MK 54 MOD 1 hardware procurements, APB software upgrades will provide significant torpedo performance improvements. APB 5 and APB 6 software development and testing is performed by NUWC Division Newport and APB 6 testing will address the testing shortfalls identified by DOT&E under the MOD 1/APB 5 OT. The APB software maximizes commonality between HWTs and LWTs and the APB 6 variant that is being developed under MK 54 MOD 1 INCREMENT 2 is the baseline SW for the MK 54 MOD 2 ALWT.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|

| Product Development (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 |
| Hardware Development - PRIOR YEAR | WR | NUWC : Newport/ Keyport | 47.640 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 47.640 | - |
| Hardware Development - MK 54 MOD 1 | WR | NUWC : Newport | 7.469 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.469 | - |
| Hardware Development - MK 54 MOD 1 | SS/FP | Progeny Systems : Not Specified | 24.394 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 24.394 | - |
| Hardware Development - HAAWC | WR | NSWCCD : Carderock, MD | 0.050 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.050 | - |
| Hardware Development - HAAWC | C/CPAF | Boeing : St. Louis, MO | 98.216 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 98.216 | - |
| Hardware Development - HAAWC | WR | NSWCDD : Dahlgren, VA | 0.400 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.400 | - |
| Hardware Development - INSENSITIVE MUNITIONS | WR | NUWC : Newport | 0.950 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Hardware Development - INSENSITIVE MUNITIONS | WR | NSWC : Indian Head, MD | 1.121 | 0.150 | Nov 2022 | 0.150 | Nov 2023 | 0.150 | Nov 2024 | - | | 0.150 | Continuing | Continuing | Continuing |
| Hardware Development - INSENSITIVE MUNITIONS | WR | NUWC : Keyport | 1.219 | 0.196 | Nov 2022 | 0.053 | Nov 2023 | 0.200 | Nov 2024 | - | | 0.200 | Continuing | Continuing | Continuing |
| Hardware Development - MK 54 MOD 1 | WR | NSWC : Indian Head, MD | 6.950 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.950 | - |
| Hardware Development - MK 54 MOD 1 | MIPR | DMEA : McClellan, CA | 0.520 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.520 | - |
| Software Development - PRIOR YEAR | WR | NUWC : Newport/ Keyport | 20.454 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 20.454 | - |
| Software Development - MK 54 MOD 1 | WR | NUWC : Newport | 5.729 | 2.813 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.542 | - |
| Software Development - MK 54 MOD 1 | MIPR | MIT : Boston, MA | 1.358 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.358 | - |
| Software Development - MK 54 MOD 1 | C/BA | ARL/PSU : State College, PA | 2.255 | 0.500 | Jan 2023 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.755 | - |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|

| Product Development (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |
| Systems Engineering - VLA | SS/FP | Lockheed Martin: VLA : Akron, OH | 7.606 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.606 | - |
| Systems Engineering - HAAWC | WR | NSWC PMA 290 : Patuxent, MD | 9.582 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 9.582 | - |
| Systems Engineering - HAAWC | WR | NAWCWD : China Lake | 6.606 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 6.606 | - |
| Systems Engineering - HAAWC | C/CPFF | John Hopkins University : Baltimore, MD | 0.050 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.050 | - |
| System Test & Evaluation - HAAWC | WR | NUWC : Newport/ Keyport | 21.931 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 21.931 | - |
| Hardware Development - ADV LWT | WR | NUWC : Newport | 1.218 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.218 | - |
| Hardware Development - ADV LWT | WR | NUWC : Keyport | 0.300 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.300 | - |
| Hardware Development - ADV LWT | WR | NSWC : Indian Head, MD | 0.270 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.270 | - |
| Hardware Development - ADV LWT | WR | NAVSEA : Washington, DC | 0.025 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.025 | - |
| Hardware Development - ADV LWT | WR | NAVAIR : Pax River, MD | 0.025 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.025 | - |
| Software Development - APB 6 | WR | NUWC : Newport | 5.637 | 1.947 | Nov 2022 | 6.955 | Dec 2023 | 5.710 | Dec 2024 | - | | 5.710 | 0.000 | 20.249 | - |
| Software Development - APB 6 | C/CPFF | Sonalyt : Waterford, CT | 0.704 | 0.000 | | 0.000 | | 0.417 | Nov 2024 | - | | 0.417 | 0.000 | 1.121 | - |
| Software Development - FCT program | C/BA | NUWC : Newport/ Keyport | 1.150 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.150 | - |
| Subtotal | | | 273.829 | 5.606 | | 7.158 | | 6.477 | | - | | 6.477 | Continuing | Continuing | N/A |

Remarks
Decreased funding in FY 2025 for APB 6 SW development to implement the Enhanced Digital Fire Control Interface (eDFCI) in the torpedo, upgrade models in the WAF, and conduct in-water developmental test events.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy | | | | | | | | | | | Date: March 2024 | | | | |
| Appropriation/Budget Activity 1319 / 5 | | | | | | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> | | | | |

| Support (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |
| Hardware Development | WR | NUWC : Newport/ Keyport | 5.532 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.532 | - |
| System Engineering Support | WR | NUWC : Newport/ Keyport | 13.293 | 1.328 | Nov 2022 | 1.825 | Nov 2023 | 1.596 | Nov 2024 | - | | 1.596 | 0.000 | 18.042 | - |
| Program Management Support | C/BA | ARL/PSU : State College, PA | 0.441 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.441 | - |
| Program Management Support | Various | NAVSEA : Not Specified | 0.168 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.168 | - |
| Systems Engineering | WR | NUWC : Newport/ Keyport | 0.120 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.120 | - |
| System Test and Evaluation | WR | NUWC : Newport/ Keyport | 34.140 | 1.870 | Nov 2022 | 1.896 | Nov 2023 | 2.144 | Nov 2024 | - | | 2.144 | 0.000 | 40.050 | - |
| System Test and Evaluation | WR | NSWC : Carderock, MD | 0.008 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.008 | - |
| System Test and Evaluation | WR | NSWC : Dahlgren, VA | 0.069 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.069 | - |
| System Test and Evaluation | WR | NAVFAC LANT : Washington, DC | 0.056 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.056 | - |
| Subtotal | | | 53.827 | 3.198 | | 3.721 | | 3.740 | | - | | 3.740 | 0.000 | 64.486 | N/A |

Remarks

FY 2025 increase for ABP 6 system engineering and Test and Evaluation to support Developmental Test In-Water Runs.

| Test and Evaluation (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NSWC : Carderock | 1.259 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.259 | - |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |
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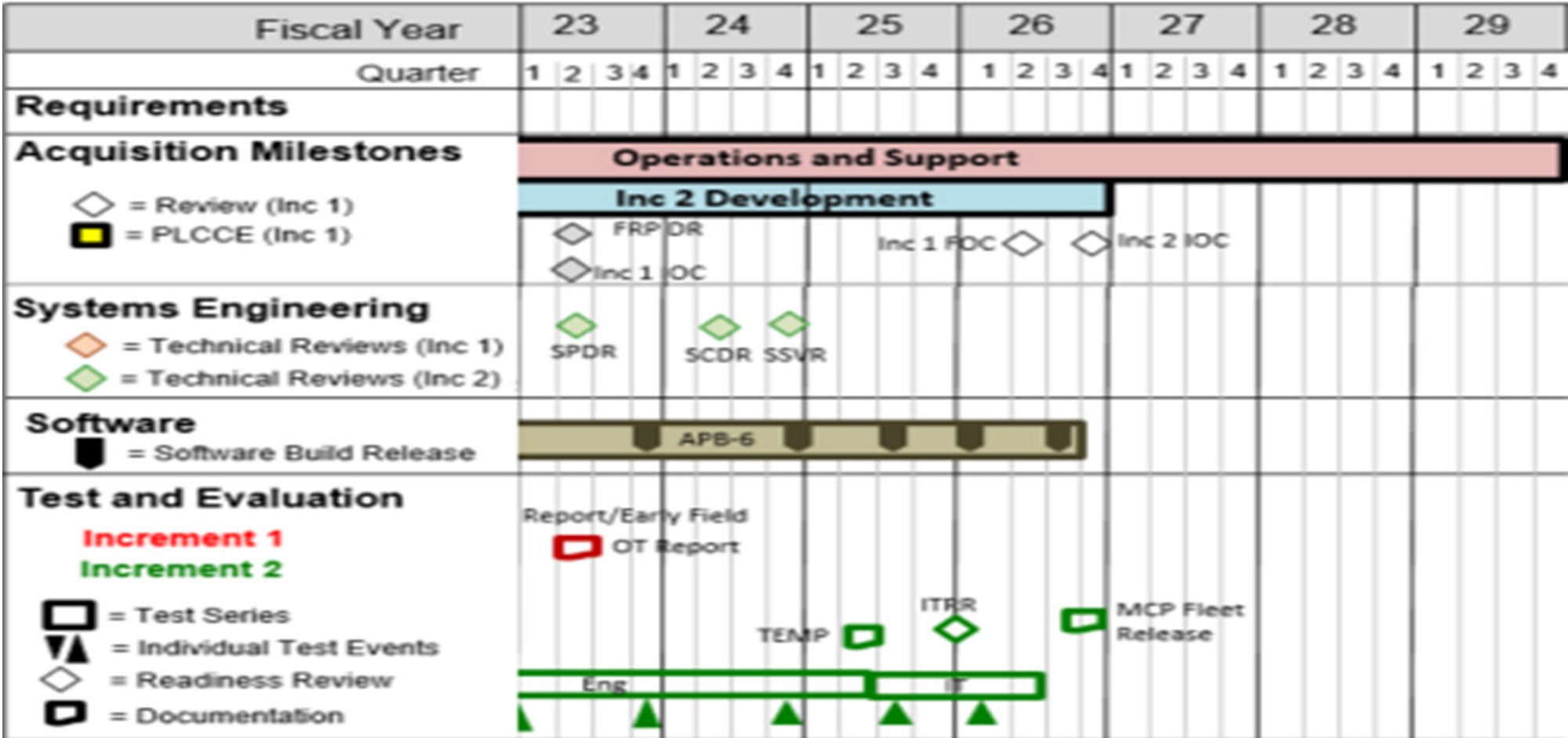
| Test and Evaluation (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 Total | Cost To Complete | Total Cost | Target Value of Contract |
|-------------------------------------------------------------------|------------------------|-------------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| 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 Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NUWC : Newport/ Keyport | 32.191 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 32.191 | - |
| Operational Test & Evaluation (OT&E) | WR | NUWC : Keyport | 19.871 | 0.450 | Nov 2022 | 1.964 | Dec 2023 | 2.003 | Dec 2024 | - | | 2.003 | 0.000 | 24.288 | - |
| Operational Test & Evaluation (OT&E) | WR | NUWC : Newport | 23.228 | 1.651 | Nov 2022 | 0.256 | Dec 2023 | 0.261 | Dec 2024 | - | | 0.261 | 0.000 | 25.396 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NSWC : Indian Head, MD | 1.676 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.676 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | C/CPIF | ARL/PSU : State College, PA | 2.029 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.029 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | Aberdeen Test Center : Aberdeen, MD | 0.731 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.731 | - |
| Operational Test & Evaluation (OT&E) | WR | OPTEVFOR : Norfolk, VA | 4.461 | 1.000 | Nov 2022 | 0.598 | Dec 2023 | 0.610 | Dec 2024 | - | | 0.610 | 0.000 | 6.669 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | OPTEVFOR : Norfolk, VA | 4.240 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 4.240 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NSWC : Dalgren, VA | 0.091 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.091 | - |
| Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E) | WR | NUWC : Keyport | 0.618 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.618 | - |
| Subtotal | | | 90.395 | 3.101 | | 2.818 | | 2.874 | | - | | 2.874 | 0.000 | 99.188 | N/A |

Remarks
Reduced requirement for T&E as focus shifts to APB 6 development and T&E planning for APB 6.

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| Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |

MK 54 MOD 1 Acquisition Schedule



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| Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 2234 / <i>Lightweight Hybrid Torpedo</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|--------------------------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Proj 2234 | | | | |
| MK 54 MOD 1 Inc 1: APB 5 / TI-1 Inc 1 IOC | 2 | 2023 | 2 | 2023 |
| MK 54 MOD 1 Inc 2: APB 6 Tactical Software Development | 1 | 2023 | 2 | 2026 |
| MK 54 MOD 1 Inc 2: Engineering Testing Complete | 3 | 2024 | 4 | 2026 |
| MK 54 MOD 1 Inc 2: DT | 4 | 2024 | 4 | 2025 |
| MK 54 MOD 1 Inc 2: OT | 1 | 2026 | 3 | 2026 |
| MK 54 MOD 1 Inc 2: APB 6 IOC | 4 | 2026 | 4 | 2026 |

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|--------------------------------------------------------------------|--------------------|----------------|----------------|---------------------|--------------------------------------------------------------------------------------------------|----------------------|----------------|----------------|-------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | | | | | | | | | | Date: March 2024 | | |
| Appropriation/Budget Activity 1319 / 5 | | | | | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Cost To Complete | Total Cost |
| 3418: <i>Advanced Anti-Submarine Lightweight Torpedo</i> | 291.068 | 116.795 | 197.331 | 123.824 | - | 123.824 | 78.084 | 35.339 | 45.337 | 46.217 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The MK 54 MOD 2 improves the lethality and speed of the LWT by upgrading the Warhead and Propulsion system to counter challenging near-peer adversary submarines that are faster and deeper diving, leveraging the sonar hardware improvements developed under the MOD 1 program. The program awarded four Other Transaction Authority (OTA) agreements to industry partners in FY 2020 for the Proof of Design (POD) of the Guidance and Control (G&C) section, Warhead, Stored Chemical Energy Propulsion System (SCEPS) afterbody sections, and All Up Round (AUR) system integrator. Industry partners are focused primarily on the development of torpedo hardware and support equipment while the USN maintains the responsibility of developing the software under the APB process and will develop specific software modules for the MK 54 MOD 2 variant. To make the program more affordable in the Proof of Manufacture (POM) Phase while still delivering necessary capability to the Fleet, the program has restructured to an incremental approach, first focused on delivering the lethality required for the intended threats. In the first increment, the program is prioritizing the G&C and Warhead development and their integration with existing LWT Otto fuel propulsion section. Increment 2 will complete the development and integration of the capability delivered by the SCEPS section and meet the full requirements defined by the Capability Development Document (CDD). Each increment will have its own test and evaluation phase and IOC. Increment 1 is focused on meeting the lethality requirements at its IOC and Increment 2 is expected to meet the full set of system requirements (as defined in the CDD) at its IOC. The program intends to award a competitive OTA in FY 2024 to a single AUR Industry partner. The winner of the OTA will complete POM of the Increment 1 AUR and procure up to the equivalent of 48 POM AUR test assets to be used in the Increment 1 Developmental and Operational Test and Evaluations. The winner of the Increment 1 OTA will be responsible for managing the subsystem and system level qualification, AUR assembly, and platform integration. Increment 2 will be competed and awarded in FY2030 and will be expected to complete development and integration of the Increment 2 AUR and procurement of POM AUR test assets to be used for the Increment 2 Developmental and Operational Test and Evaluations.

FY 2025 funding will be used to procure Increment 1 AUR POM hardware, associated test spares, test sets and support equipment to support the execution of POM qualification testing and engineering in-water runs. FY 2025 funding will be used primarily for subcontracts to the major subsystems (G&C, WH, and FES) to procure POM Hardware for qualification and delivery of subsystems under the Increment 1 AUR POM contract planned for award in FY 2024. Modification and integration of the existing LWT Otto fuel afterbody with the POM G&C and Warhead will be a collaboration between Government, UARC, and industry partners, and included as part of the scope of the Increment 1 AUR tasking. Long Lead Materials are being procured in FY 2023 under the POD subsystem OTA agreements ahead of the POM effort to meet the aggressive schedule. The remaining critical materials to support the G&C, WH, and FES subsystems will be procured in FY 2024 under the Increment 1 AUR system OTA agreement. The winner of the Increment 1 AUR/POM phase OTA agreement is required to complete hardware development and provide the tests assets needed to execute engineering, qualification, developmental and operational test programs in preparation for the follow-on LRIP and deployment phases of the Increment 1 capability. The program will also continue in-water engineering testing with POD Hardware through FY 2025. Operational software development, modeling and simulation verification, platform integration, live warhead testing, and fleet exercise section development efforts will continue in FY 2025 to support Increment 1 engineering and qualification efforts. SCEPS POD development efforts will be completed in FY 2025, but further integration tasking and POM development will be

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | Date: March 2024 |
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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

deferred until Increment 2. Studies will be conducted in FY2024 to determine the compatibility of the MK 54 MOD 2 Increment 1 with the existing HAAWC design without any major hardware modifications. The redesign of the HAAWC will align with the MK 54 MOD 2 Increment 2 development that has been deferred to FY2030.

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

| | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|--------------|-------------|---------------|
| Title: ALWT Development | 116.795 | 197.331 | 123.824 | 0.000 | 123.824 |
| Articles: | - | - | - | - | - |
| FY 2024 Plans: | | | | | |
| <ul style="list-style-type: none"> -Conduct System Level Critical Design Review (CDR). -Continue MOD 2 APB software development. -Complete Propulsion Section Proof of Design delivery. -Continue Guidance and Control (G&C) Section Proof of Design delivery. -Complete Warhead section Proof of Design delivery. -Cancel original Phase II RPP and restructure the program Acquisition Strategy to an Incremental Approach. -Solicit and Award Increment 1 POM OTA to complete Increment 1 AUR development and POM. -Continue Fleet Exercise Section (FES) development. -Continue test set (Warhead/Engine/All up Round) development. -Continue ship integration interface design. -Continue hardware development for Warhead section, Guidance & Control section, and Propulsion. -Continue EC WAF modeling and simulation accreditation. -Continue system test bed development. -Continue MH-60R/P-8A Integration Interface Design (hardware updates and interface software development). -Continue Air Launch Accessory (ALA) Initial System Design. -Conduct procurement non-Long Lead Material supporting Phase II Proof of Manufacture Design. -Conduct initial in-water engineering runs. -Conduct qualification testing. | | | | | |
| FY 2025 Base Plans: | | | | | |
| <ul style="list-style-type: none"> -Continue MOD 2 APB software development. -Complete Guidance and Control (G&C) Section Proof of Design delivery. -Continue AUR Phase II Increment 1 OTA for completing Increment 1 AUR design and development. -Continue Fleet Exercise Section (FES) development. -Continue test set (Warhead/Engine/All up Round) development. -Continue ship integration interface design. -Continue hardware development for Warhead section, and Guidance & Control section. -Commence modification, integration, and testing of existing LWT Propulsion system with G&C and Warhead. | | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |

| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2023 | FY 2024 | FY 2025 Base | FY 2025 OCO | FY 2025 Total |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| -Continue EC WAF modeling and simulation accreditation. -Continue system test bed development. -Continue MH-60R/P-8A Integration Interface Design (hardware updates and interface software development). -Continue Air Launch Accessory (ALA) Initial System Design. -Continue in-water engineering runs. -Continue qualification testing. FY 2025 OCO Plans: N/A FY 2024 to FY 2025 Increase/Decrease Statement: Decreased funding from FY 2024 to FY 2025 by \$73.507M for Phase II AUR hardware development contract (\$66.750M) and hardware development support and integration (\$6.757M). | | | | | |
| Accomplishments/Planned Programs Subtotals | 116.795 | 197.331 | 123.824 | 0.000 | 123.824 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|----------------------------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| <u>Line Item</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025 Base</u> | <u>FY 2025 OCO</u> | <u>FY 2025 Total</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>FY 2029</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
| • WPN/3215: <i>MK-54 Torpedo Mods</i> | 103.367 | 104.086 | 106.249 | - | 106.249 | 136.313 | 138.019 | 141.040 | 143.879 | Continuing | Continuing |

Remarks
LI 3215 FYDP funds MK 54 MOD 0, MK 54 MOD 1, MK 54 MOD 2 and HAAWC procurements.

D. Acquisition Strategy
The Acquisition Strategy is to use University Affiliated Research Centers (UARCs), Warfare Centers, and competitive Other Transactional Authority (OTA) agreements with industry to prototype a new Advanced Lightweight Torpedo split into two increments to deliver partial capability (focused on lethality) as quickly as possible within the budget in the first increment and full capabilities as defined in the CDD under the second increment. The program will then pursue accelerated acquisition LRIP opportunities while preparing for full and open FRP competition for each increment. This accelerated approach requires full initial funding and continued funding to procure long lead materials to ensure all prototyping efforts deliver a fully integrated and production-ready weapon. Scope of effort includes weapon, launch platform integration, and all associated subsystems and supporting capabilities. Four OTAs awarded and executing Proof of Design (POD) phase:
(1) Northrop Grumman - Warhead Section
(2) Aerojet - Afterbody Section
(3) Progeny - G&C Section

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| Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |
| <p>(4) Raytheon - All-Up-Round (AUR), Test Sets, Test Shapes, Air Launch Accessories, and Fleet Exercise Sections (FES)</p> <p>Following the POD phase, a competitive Proof of Manufacturing (POM) OTA will be awarded to a single prime contractor to complete Increment 1 system and subsystem level prototype development, integration, and delivery of AUR POM units starting in FY 2025. These POM units will be used to validate performance through land-based testing and in-water qualification, development, and operational testing. Upon satisfactory completion of the Increment 1 POM OTA, a sole-source FAR-based Low-Rate Initial Production (LRIP) contract may be awarded to the Increment 1 POM phase prime contractor to provide initial deliveries of the Increment 1 capability to the fleet. This will be followed by a competitively awarded FAR-based full-rate production contract. Increment 2 will compete the POM development of the capability provided by the SCEPS engine and integration with the POM G&C and Warhead developed under Increment 1 to deliver the full MK 54 MOD 2 capability specified in the MK 54 MOD 2 CDD. Increment 2 will also award a follow-on FAR-based LRIP and FRP contract upon successful completion of the Increment 2 POM phase.</p> | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy | | | | | | | | | | | | Date: March 2024 | | | |
|--------------------------------------------------------|------------------------|----------------------------------------------------------|-------------|------------------------------------------------------|------------|---------|------------|-----------------------------------------------------------|------------|-------------|------------|------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity | | | | R-1 Program Element (Number/Name) | | | | Project (Number/Name) | | | | | | | |
| 1319 / 5 | | | | PE 0604610N / <i>Lightweight Torpedo Development</i> | | | | 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> | | | | | | | |
| Product Development (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 |
| Software Development | WR | NUWC : Newport, RI | 14.767 | 7.877 | Nov 2022 | 7.975 | Nov 2023 | 7.808 | Nov 2024 | - | | 7.808 | 0.000 | 38.427 | - |
| Hardware Development | WR | NUWC : Newport, RI | 12.694 | 3.860 | Nov 2022 | 1.141 | Nov 2023 | 1.201 | Nov 2024 | - | | 1.201 | Continuing | Continuing | Continuing |
| Hardware Development | WR | NUWC : Keyport, WA | 15.051 | 9.831 | Nov 2022 | 8.469 | Nov 2023 | 4.475 | Nov 2024 | - | | 4.475 | 0.000 | 37.826 | - |
| Hardware Development | WR | NSWC : Indian Head, MD | 5.328 | 3.409 | Nov 2022 | 1.581 | Nov 2023 | 0.795 | Nov 2024 | - | | 0.795 | 0.000 | 11.113 | - |
| Hardware Development - AUR | C/CPFF | ARL/PSU : State College, PA | 39.980 | 10.578 | Nov 2022 | 9.459 | Nov 2023 | 6.675 | Nov 2024 | - | | 6.675 | 0.000 | 66.692 | - |
| Hardware Development | WR | PEO-IWS : Washington, DC | 3.119 | 0.276 | Nov 2022 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.395 | - |
| Software Development - Platform Integration | WR | NAVAIR : Pax River, MD | 20.183 | 4.293 | Nov 2022 | 11.089 | Nov 2023 | 10.965 | Nov 2024 | - | | 10.965 | 0.000 | 46.530 | - |
| Hardware Development - G&C | C/CPIF | OTA - Progeny : Manassas, VA | 13.464 | 5.984 | Dec 2022 | 0.000 | | 3.482 | Dec 2024 | - | | 3.482 | 0.000 | 22.930 | - |
| Hardware Development - New engine | C/CPIF | OTA - Aerojet Rocketdyne : Huntsville, AL | 74.161 | 13.312 | Jan 2023 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 87.473 | - |
| Hardware Development - Warhead | C/CPIF | OTA - Northrop Grumman Innovation Systems : Plymouth, MN | 36.653 | 16.016 | Jan 2023 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 52.669 | - |
| Hardware Development - AUR | C/CPIF | OTA - Raytheon : Portsmouth, RI | 44.865 | 23.412 | Jan 2023 | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 68.277 | - |
| Hardware Development | WR | NSWC : Philadelphia, PA | 0.000 | 0.346 | Nov 2022 | 0.243 | Nov 2023 | 0.079 | Nov 2024 | - | | 0.079 | 0.000 | 0.668 | - |
| Software Development | WR | NSWCCD : Carderock, MD | 0.000 | 1.168 | Nov 2022 | 0.040 | Nov 2023 | 0.100 | Nov 2024 | - | | 0.100 | 0.000 | 1.308 | - |
| Hardware Development Phase II AUR | C/CPIF | OTA - TBD : Location TBD | 0.000 | 2.765 | Jan 2023 | 127.065 | Dec 2023 | 60.315 | Dec 2024 | - | | 60.315 | 0.000 | 190.145 | - |
| Software Development - Platform Integration | C/CPIF | CTR - TBD : Location TBD | 0.000 | 9.315 | Dec 2023 | 17.898 | Dec 2023 | 12.841 | Dec 2024 | - | | 12.841 | 0.000 | 40.054 | - |
| Subtotal | | | 280.265 | 112.442 | | 184.960 | | 108.736 | | - | | 108.736 | Continuing | Continuing | N/A |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

| | | |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

| Product Development (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |

Remarks
Decreased funding in FY 2025 due to a reallocation to higher Navy priorities and the originally planned reduction in spending as the result of a shift in focus to production of Proof of Manufacturing (POM) hardware following completion of Critical Design.

| Support (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |
| Systems Engineering | WR | NUWC NPT : Newport, RI | 3.387 | 1.788 | Nov 2022 | 1.292 | Nov 2023 | 1.033 | Nov 2024 | - | | 1.033 | 0.000 | 7.500 | - |
| Subtotal | | | 3.387 | 1.788 | | 1.292 | | 1.033 | | - | | 1.033 | 0.000 | 7.500 | N/A |

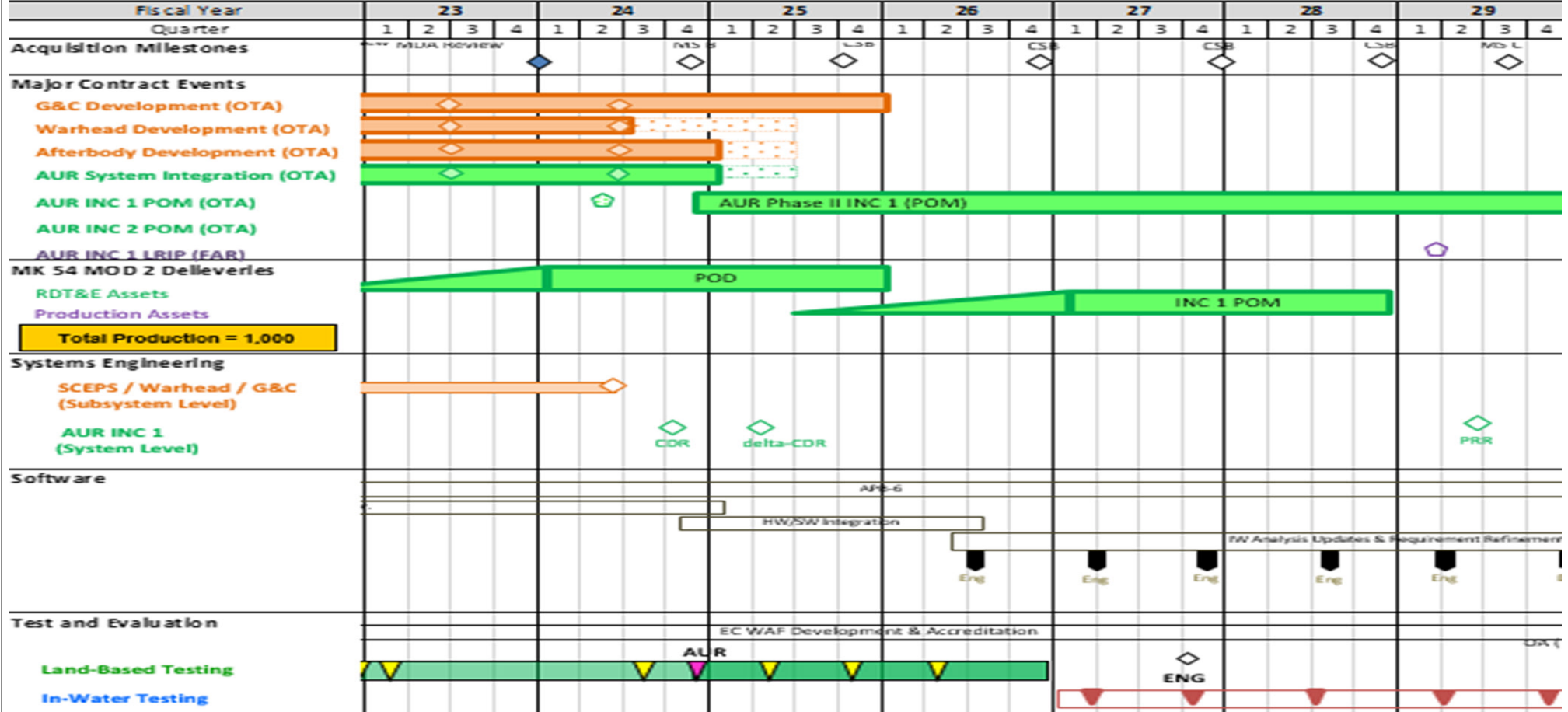
Remarks
Decreased funding in FY2025 due to the shift in support requirements from Product Development to Test and Evaluation.

| Test and Evaluation (\$ in Millions) | | | | FY 2023 | | FY 2024 | | FY 2025 Base | | FY 2025 OCO | | FY 2025 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 | | | |
| Developmental Test & Evaluation (DT&E) | WR | NUWC : Newport, RI | 4.847 | 1.410 | Nov 2022 | 2.116 | Nov 2023 | 2.594 | Nov 2024 | - | | 2.594 | 0.000 | 10.967 | - |
| Developmental Test & Evaluation (DT&E) | WR | OPTEVFOR : Norfolk, VA | 0.000 | 0.255 | Nov 2022 | 0.207 | Nov 2023 | 0.207 | Nov 2024 | - | | 0.207 | 0.000 | 0.669 | - |
| Developmental Test & Evaluation (DT&E) | WR | NUWC : Keyport, WA | 0.000 | 0.000 | | 5.014 | Nov 2023 | 6.796 | Nov 2024 | - | | 6.796 | 0.000 | 11.810 | - |
| Developmental Test & Evaluation (DT&E) | C/BA | NSWC : Indian Head, MD | 0.000 | 0.000 | | 2.824 | Nov 2023 | 3.522 | Nov 2024 | - | | 3.522 | 0.000 | 6.346 | - |
| Subtotal | | | 4.847 | 1.665 | | 10.161 | | 13.119 | | - | | 13.119 | 0.000 | 29.792 | N/A |

Remarks
Increased funding in FY 2025 for NUWC Newport to continue support of in-water engineer testing.
Increased funding in FY 2025 for NUWC Keyport to continue support of in-water engineer testing.

| | | |
|---------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |

MK 54 MOD 2 Acquisition Schedule



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| | | |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy | | Date: March 2024 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604610N / <i>Lightweight Torpedo Development</i> | Project (Number/Name) 3418 / <i>Advanced Anti-Submarine Lightweight Torpedo</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|---------------------------------------------------------------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Proj 3418 | | | | |
| Advanced Lightweight Torpedo (ALWT): ALWT MS-B | 4 | 2024 | 4 | 2024 |
| Advanced Lightweight Torpedo (ALWT): ALWT SCEPS Development / Phase 1 | 1 | 2023 | 2 | 2025 |
| Advanced Lightweight Torpedo (ALWT): ALWT Warhead Development / Phase 1 | 1 | 2023 | 2 | 2025 |
| Advanced Lightweight Torpedo (ALWT): ALWT G&C Hardware / Software Development / Phase 1 | 1 | 2023 | 4 | 2025 |
| Advanced Lightweight Torpedo (ALWT): ALWT AUR Development Integration / Phase 1 | 1 | 2023 | 2 | 2025 |
| Advanced Lightweight Torpedo (ALWT): ALWT AUR Development Integration / Phase 2 INC 1 (POM) | 4 | 2024 | 4 | 2029 |
| Advanced Lightweight Torpedo (ALWT): ALWT Land Based Testing | 1 | 2023 | 4 | 2026 |
| Advanced Lightweight Torpedo (ALWT): Engineering Testing | 1 | 2027 | 4 | 2029 |