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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

| | |
|--|---|
| Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization |
|--|---|

| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
|--|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 1,158.656 | 75.822 | 92.682 | 95.693 | - | 95.693 | - | - | - | - | - | - |
| 0219: <i>Sub Sonar Improvement (ENG)</i> | 1,097.045 | 55.419 | 62.701 | 64.080 | - | 64.080 | - | - | - | - | - | - |
| 0775: <i>Submarine Supt Equip Prog</i> | 61.611 | 20.403 | 29.981 | 31.613 | - | 31.613 | - | - | - | - | - | - |

Note

Beginning in FY20, funding for the following projects was realigned from PE 0603503N to PE 0604280N: Project 0742 - Sub Integrated Antenna System and Project 1411 - Sub Tactical Communication System.

A. Mission Description and Budget Item Justification

SSN-688 & Trident Modernization delivers block updates to Submarine Sonar systems and develops improved Submarine Electronic Warfare (EW) systems. These development activities ensure all Submarine Classes maintain clear acoustical, tactical, and operational superiority over Submarines and Surface Combatants in Joint Littoral Warfare, Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings, Information Operations including Cyber, and Special Operations Force (SOF) support. Current developments are focused on supporting Joint Littoral Warfare, Regional Sea Denial, Strike Group Support, Diesel Submarine Detection, Joint Surveillance and Peacetime Engagement, Space and Electronic Warfare, Intelligence Collection, Maritime Protection, and Joint Strike.

FY 2022 funding request reflects a net increase of \$3.01 million from FY 2021 to FY 2022. Funding increase is associated with APB-21 design, integration, and testing efforts associated with TI-22, which transitions Acoustic Rapid COTS Insertion (A-RCI) to Development, Cyber Security, and Operations (DevSecOps) in the TI/APB process to better align with software development industry standards and meet fleet demands for rapid capability deliveries and increased focus on machine learning, automation, and behavioral analysis, Light Weight Wide Aperture Array (LwWAA) technology refresh development, and an emergent requirement to develop the PATRIOT Phase C RADAR.

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy | Date: May 2021 |
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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 0604503N / <i>SSN-688 & Trident Modernization</i> |
|--|--|

| B. Program Change Summary (\$ in Millions) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 78.625 | 93.097 | 94.788 | - | 94.788 |
| Current President's Budget | 75.822 | 92.682 | 95.693 | - | 95.693 |
| Total Adjustments | -2.803 | -0.415 | 0.905 | - | 0.905 |
| • Congressional General Reductions | - | -0.415 | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | -0.001 | 0.000 | | | |
| • SBIR/STTR Transfer | -2.802 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | 2.497 | - | 2.497 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -1.592 | - | -1.592 |

Change Summary Explanation

FY 2020 reflects a \$2.803 million reduction for SBIR Assessment and cancelled account liabilities. FY 2021 reflects a \$0.415 million reduction associated with General Congressional Reductions. FY 2022 reflects a net increase of \$0.905 million associated with an increase of \$2.497 million for Light Weight Wide Aperture Array (LwWAA) technology refresh development and a decrease of \$1.592 million for miscellaneous rate adjustments. The additional funds for LwWAA support additional capability development to preclude obsolescence and keep pace with an increasingly challenging environment.

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 1319 / 5 | | | | | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | | | | Project (Number/Name) 0219 / Sub Sonar Improvement (ENG) | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 0219: Sub Sonar Improvement (ENG) | 1,097.045 | 55.419 | 62.701 | 64.080 | - | 64.080 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The AN/BQQ-10(V) Acoustic Rapid COTS Insertion (A-RCI) submarine SONAR system will continue to add new capabilities via Technical Insertion (TI)/Advanced Processing Build (APB) process while working across Submarine Warfare Federated Tactical System (SWFTS) programs to transition to Development Security Operations (DevSecOps) software processes and migrate to a cloud based architecture. The Navy is pursuing a transformation across SWFTS (PE 0604503N Project 0219, PE 0604562N Project 0236, PE 0604777N Project 0253 and PE 0604503N Project 0775) to maximize cyber-resiliency and the speed of capability delivery.

FY 2022 funding request reflects a net increase of \$1.379 million from FY 2021 to FY 2022. Funding increase is associated with APB-21 design, integration, and testing efforts associated with TI-22, which transitions Acoustic Rapid COTS Insertion (A-RCI) to Development, Cyber Security, and Operations (DevSecOps) in the TI/APB process to better align with software development industry standards and meet fleet demands for rapid capability deliveries as well as increased focus on machine learning, automation, and behavioral analysis. Increase also associated with design, integration, and testing efforts associated with the Light Weight Wide Aperture Array (LwWAA) technical refresh for Block I/II VIRGINIA Class Submarines.

This program delivers block updates to Sonar Systems installed on SSN 688, 688I, SSN 21, VIRGINIA, SSBN, and SSGN Class Submarines to maintain clear acoustical, tactical, and operational superiority over Submarines and Surface Combatants in all scenarios through detection, classification, localization, and contact following.

Acoustics Rapid COTS Insertion (A-RCI) provides multi-phased evolutionary development geared toward addressing acoustic superiority issues through the rapid introduction of interim development products applicable to all Classes of Submarines.

- A-RCI Phase I and II introduced Towed Array processing improvements
- Phase III introduced Spherical Array processing improvements
- Phase IV provided High Frequency (HF) Array processing improvements for SSN 688I, SSGN, SSBN, VIRGINIA, and SSN 21 Class Submarines.

As part of the Navy's plan to maintain acoustic superiority for in-service submarines, a joint cooperative effort was established to deliver bi-annual Advanced Processing Builds (APBs) to prevent obsolescence and deliver ongoing capability improvements.

- Capabilities in the APBs will be integrated as part of A-RCI certified systems.

Sensor Efforts provide increased operational capabilities for littoral operations, situational awareness, and reliability improvements.

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | Project (Number/Name) 0219 / Sub Sonar Improvement (ENG) |

| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| <p>Title: APB Productionization</p> <p align="right">Articles:</p> <p>Description: APB Productionization provides for the transition of APB capability improvements to the Fleet for integration, testing and formal certification.</p> <p>FY 2021 Plans: -Continue Advanced Processing Build (APB) development and transition of APB software from development to A-RCI for integration, testing, and formal certification. -Ensure continued transition of the SSBN legacy sonar system to the TI/APB model. -Transition development of in-board signal processing associated with the Large Vertical Array (LVA) to VIRGINIA Class modernization.</p> <p>FY 2022 Base Plans: -Continue Advanced Processing Build (APB) development and transition of APB software from development to A-RCI for integration, testing, and formal certification for SEAWOLF, 688/688I, OHIO, VIRGINIA, and COLUMBIA Class submarines. -Ensure continued transition of the SSBN legacy sonar system to the TI/APB model.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: Funding increase is associated with the APB development for VIRGINIA and COLUMBIA Class.</p> | 14.461 | 14.751 | 15.046 | 0.000 | 15.046 |
| | - | - | - | - | - |
| <p>Title: Integration and Testing</p> <p align="right">Articles:</p> <p>Description: Integration and Testing provides support to integrate and test APBs into all Submarine Classes containing multiple sensor systems.</p> <p>FY 2021 Plans: -Continue support of Advanced Processing Builds installed on SSN688I, SSN 21, SSBN, SSGN, and VA Class Submarines. -Continue the incorporation of integration and testing associated with the conversion of the SSBN legacy sonar system to the TI/APB model.</p> | 37.230 | 44.148 | 45.156 | 0.000 | 45.156 |
| | - | - | - | - | - |

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| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| <p>-Continue integration and testing associated with signal processing in support of Large Vertical Array (LVA) on SSBN and VA Class submarines.</p> <p>-Prepare transition of A-RCI APB content delivery to Submarine Warfare Federated Tactical Systems (SWFTS) Continuous Capability Insertion Model through implementation of Development, Cyber Security, and Operations (DevSecOps) and Agile development for flexible APB content releases to fleet platforms.</p> <p>FY 2022 Base Plans:</p> <p>-Continue support of Advanced Processing Builds installed on SSN688I, SSN 21, SSBN, SSGN, and VA Class Submarines.</p> <p>-Continue integration and testing associated with signal processing in support of Large Vertical Array (LVA) on SSBN and VA Class submarines.</p> <p>-Transition A-RCI APB content delivery to SWFTS Continuous Capability Insertion Model through implementation of Development, Cyber Security, and Operations (DevSecOps) and Agile development for flexible APB content releases to fleet platforms.</p> <p>-Design, integrate, and test efforts associated with the Light Weight Wide Aperture Array (LWWAA) technical refresh for Block I/II VIRGINIA Class Submarines.</p> <p>FY 2022 OCO Plans:</p> <p>N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p> <p>Funding increase associated with design, integration, and testing efforts associated with the Light Weight Wide Aperture Array (LWWAA) technical refresh for Block I/II VIRGINIA Class Submarines as well as APB-21 design, integration, and testing efforts associated with TI-22, which transitions A-RCI to Development, Cyber Security, and Operations (DevSecOps) in the TI/APB process to better align with software development industry standards and meet fleet demands for flexible capability deliveries. These efforts increase focus on machine learning, automation, and behavioral analysis.</p> | | | | | |
| <p>Title: A-RCI Acoustic Superiority Integration</p> <p align="right">Articles:</p> <p>Description: Maintain Acoustic Superiority for In-service Submarines to deliver bi-annual Advance Processing Builds (APBs) to prevent obsolescence and deliver emerging capability improvements for current and future threats.</p> <p>FY 2021 Plans:</p> | 3.728 | 3.802 | 3.878 | 0.000 | 3.878 |
| | - | - | - | - | - |

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| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | Project (Number/Name) 0219 / Sub Sonar Improvement (ENG) |

| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|--|----------------|----------------|---------------------|--------------------|----------------------|
| -Continue development of emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of Navy SSN/SSBN Acoustic Superiority initiatives. FY 2022 Base Plans: -Continue development of emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of Navy SSN/SSBN Acoustic Superiority initiatives. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Funding increase is associated with the continuation of A-RCI transition to Development, Security, and Operations (DevSecOps) in the TI/APB process. | | | | | |
| Accomplishments/Planned Programs Subtotals | 55.419 | 62.701 | 64.080 | 0.000 | 64.080 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| Line Item | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| • OPN/2150: SSN Acoustic Equipment | 367.555 | 372.822 | 379.850 | - | 379.850 | - | - | - | - | - | - |

Remarks

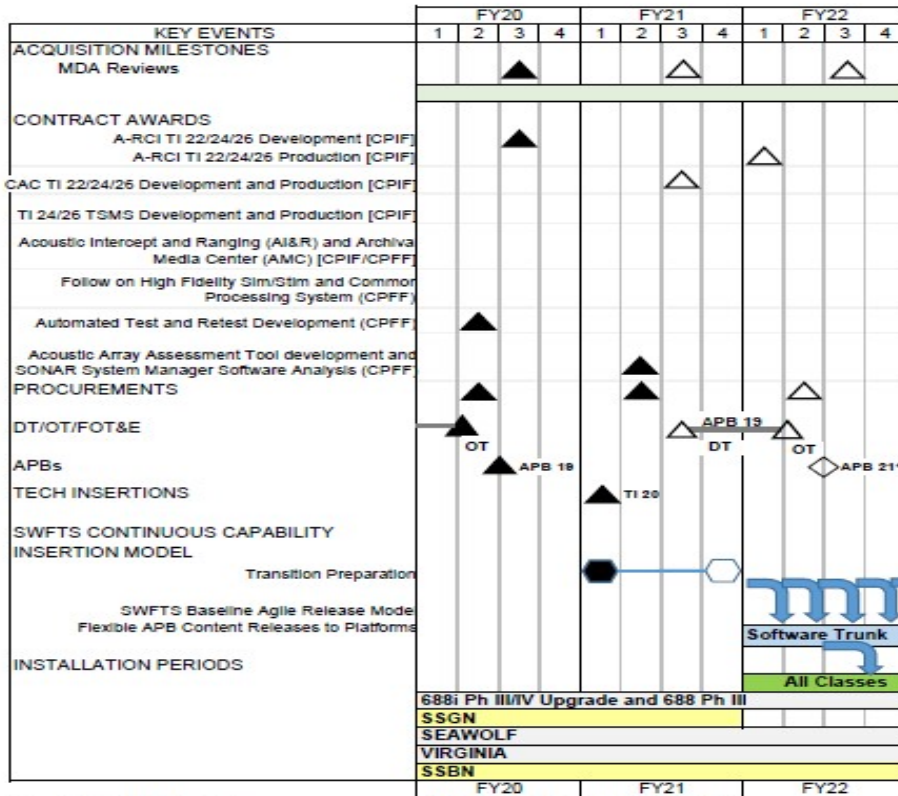
D. Acquisition Strategy
Acoustic Systems:
-A-RCI utilizes an open architecture and Commercial Off-the-Shelf (COTS) products in support of new and upgraded sonar systems.
-Program Reviews with the Milestone Decision Authority (MDA) are conducted in conjunction with approval for contract production options.

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|--------------------------------------|-------------|---|------------|---------|------------|--------------|------------|------------------------------------|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity | | | | R-1 Program Element (Number/Name) | | | | | | Project (Number/Name) | | | | | |
| 1319 / 5 | | | | PE 0604503N / SSN-688 & Trident Modernization | | | | | | 0219 / Sub Sonar Improvement (ENG) | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | | | |
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Cost To Complete | Total Cost | Target Value of Contract |
| Primary Hardware Development | SS/CPIF | LMC : Manassas, VA | 391.112 | 20.647 | Dec 2019 | 23.276 | Dec 2020 | 23.874 | Dec 2021 | - | | 23.874 | - | - | - |
| Ancillary Hardware Development | SS/CPFF | ARL University of Texas : Austin, TX | 47.298 | 2.784 | Mar 2020 | 3.185 | Mar 2021 | 3.202 | Mar 2022 | - | | 3.202 | - | - | - |
| Systems Engineering | SS/CPFF | Johns Hopkins APL : Baltimore, MD | 49.466 | 2.800 | Dec 2019 | 3.202 | Dec 2020 | 3.319 | Dec 2021 | - | | 3.319 | - | - | - |
| Systems Engineering | C/CPFF | LMC : VA - Keyport | 46.838 | 2.963 | Jan 2020 | 3.389 | Jan 2021 | 3.413 | Jan 2022 | - | | 3.413 | - | - | - |
| Primary Hardware Development | C/CPIF | Progeny Systems : Manassas, VA | 84.016 | 5.715 | Jan 2020 | 6.538 | Jan 2021 | 6.618 | Jan 2022 | - | | 6.618 | - | - | - |
| Systems Engineering | WR | NUWC : Newport, RI | 189.349 | 8.768 | Dec 2019 | 10.029 | Dec 2020 | 10.096 | Dec 2021 | - | | 10.096 | - | - | - |
| Systems Engineering | WR | NSWC : Carderock, MD | 35.363 | 2.506 | Dec 2019 | 2.867 | Dec 2020 | 2.972 | Dec 2021 | - | | 2.972 | - | - | - |
| Subtotal | | | 843.442 | 46.183 | | 52.486 | | 53.494 | | - | | 53.494 | - | - | N/A |
| Support (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | | | |
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Cost To Complete | Total Cost | Target Value of Contract |
| Primary Software Development | C/CPIF | General Dynamics, AIS : Fairfax, VA | 175.165 | 4.619 | Dec 2019 | 5.145 | Dec 2020 | 5.333 | Dec 2021 | - | | 5.333 | - | - | - |
| Primary Software Development | C/CPFF | Sedna Digital, : Manassas, VA | 48.211 | 3.493 | Dec 2019 | 3.891 | Dec 2020 | 4.034 | Dec 2021 | - | | 4.034 | - | - | - |
| Subtotal | | | 223.376 | 8.112 | | 9.036 | | 9.367 | | - | | 9.367 | - | - | N/A |
| Test and Evaluation (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Operational Test and Evaluation | WR | OPTEVFOR : Norfolk, VA | 11.717 | 0.429 | Dec 2019 | 0.481 | Dec 2020 | 0.499 | Dec 2021 | - | | 0.499 | - | - | - |
| Subtotal | | | 11.717 | 0.429 | | 0.481 | | 0.499 | | - | | 0.499 | - | - | N/A |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy | | Date: May 2021 |
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- ▲ Completed Milestone
- ▲ Upcoming Milestone
- ◇ Agile Release Model APB Cycle*

APB: Advanced Processing Builds
 TSMS: Total Ship Monitoring System
 CAC: Common Acoustic Cabinet

*APB release cycle dates variable due to sea test availability, content maturity, etc per SWFTS Baseline Agile Release

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| SSN Installation Period |
| SSGN/SSBN Installation Period |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy | | Date: May 2021 |
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Schedule Details

| Events by Sub Project | Start | | End | |
|---------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Proj 0219 | | | | |
| ACOUSTICS | 1 | 2020 | 4 | 2022 |
| ---Acquisition Milestones - Acoustics | 3 | 2021 | 3 | 2022 |
| ---Annual Program Reviews - Acoustics | 1 | 2020 | 4 | 2022 |
| ---Contract Awards - Acoustics | 3 | 2021 | 2 | 2022 |
| ---Procurements - Acoustics | 2 | 2021 | 2 | 2022 |
| ---DT/OT/FOT&E Tests | 2 | 2021 | 2 | 2021 |
| ---APB Deliveries | 2 | 2022 | 3 | 2022 |
| ---Tech Insertions | 1 | 2021 | 1 | 2021 |
| ---Installation Periods - Acoustics | 1 | 2020 | 4 | 2022 |

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| Appropriation/Budget Activity 1319 / 5 | | | | | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | | | | Project (Number/Name) 0775 / Submarine Supt Equip Prog | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 0775: Submarine Supt Equip Prog | 61.611 | 20.403 | 29.981 | 31.613 | - | 31.613 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

AN/BLQ-10 Electronic Warfare (EW) system will continue to add new capabilities via Technical Insertion (TI)/Advanced Processing Build (APB) process while working across Submarine Warfare Federated Tactical System (SWFTS) programs to transition to Development Security Operations (DevSecOps) software processes and migrate to a cloud based architecture. The Navy is pursuing a transformation across SWFTS (PE 0604503N Project 0219, PE 0604562N Project 0236, PE 0604777N Project 0253 and PE 0604503N Project 0775) to maximize cyber-resiliency and the speed of capability delivery. Major new capabilities include a modern server-based Communications Acquisition and Direction Finding (CADF) capability, PATRIOT Phase C RADAR, and upgraded and new tactical software solutions. Funding increases in FY22 by \$1.632M to conduct the next step of the EW digital transformation and is performed in coordination with the rest of the SWFTS programs. Additionally, this funding completes engineering and manufacturing of mature system development tasks for integration of TI-22 capabilities which consists of two baselines on the SEAWOLF Class and 688 Class submarines. Completing this integration is crucial in providing 688 and SEAWOLF submarines with the next generation of tactical advantages.

The Submarine Support Equipment Program (SSEP) is responsible for the development and improvement of submarine EW systems in support of effective operations in the following mission areas: Joint Littoral Warfare; Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings; Electronic Warfare; Information Operations including Cyber; and Special Operations Force (SOF) support. The rapid proliferation of complex radar, communications and navigation equipment available to potential adversaries creates an increasingly dense and sophisticated electromagnetic environment. Sustained and significant improvements to submarine EW systems are required to maintain tactical ship safety and operational effectiveness. As such, EW was raised to a submarine primary mission area in FY2012 by Commander Submarine Forces, and EW is listed as a Tier 1 modernization requirement by the Submarine Tactical Requirements Group (STRG).

- TI-22 provides the same critical update to 688i and SEAWOLF class ships as TI-20 provided to the VA Class and bring a modern server-based CADF capability. Additionally, TI-22 looks to improve the high-speed network and signal distribution systems developed in TI-20 as well as integrate new generations of EW Payloads. Funding is critical to developing enabling technologies that will provide maximized electronic spectrum digitization and processing, allowing Submarine EW system to continue to pace the threat. The EW environment is increasingly complex and crowded. The paradigms, algorithms, and analog systems the Navy has relied on for decades are no longer able to maintain tactical relevance in the digital era of low power radars with digital waveforms. Tactical decision makers are unable to maintain awareness of the EW spectrum with current systems. Without significant investment in TI-22, the Submarine Navy will not be able to maintain littoral presence, conduct Anti-Access Area Denial operations, coordinated strike operations, joint ISR, and SOF support.

- PATRIOT Phase C RADAR improves upon the PATRIOT by updating components for obsolescence, reducing adversary detectability, and improving reliability. PATRIOT RADAR provides a covert RADAR capability for submarines when submerged.

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- APB-21 continues to bring new capabilities to the AN/BLQ-10 system: Voice to Text, improved Direction Finding for Photonics Masts, EW contact followers, and passive ranging techniques.

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

| | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|--|---------|---------|--------------|-------------|---------------|
| <p>Title: Submarine Support Equipment Program</p> <p align="right">Articles:</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> -- In the SWFTS TI/APB model, develop a CADF capability for incorporation into the AN/BLQ-10 system to enhance the capabilities of the SSN 688 and 21 class ships. -- Initiate development of the PATRIOT Phase C RADAR. -- Commence TI-22 development, design, integration, configuration, architecture documentation and software design. -- Complete TI-20 development and laboratory testing. -- Continue APB-21 development. -- Complete APB-19 integration into TI-20. -- Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement via the APB process to fully utilize the new technology being fielded in TI-20 with broader spectrum digitization. -- Coordinate with ONR and NUWC Newport to develop FNCs to a high technology readiness level and transition to EW systems as appropriate. -- Develop advanced technology demonstrations for feasibility. <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> -- In the SWFTS TI/APB model, continue to develop and test a CADF capability for incorporation into the AN/BLQ-10 system to enhance the capabilities of the SSN 688 and 21 class ships. -- Complete development of the PATRIOT Phase C RADAR. -- Continue TI-22 development, design, integration, configuration, architecture documentation and software design. -- Conduct TI-20 testing. -- Continue APB-21 development and integration into TI-20 and TI-22 baselines. -- Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement via the APB process to fully utilize the new technology being fielded in TI-22 with broader spectrum digitization. | 20.403 | 29.981 | 31.613 | 0.000 | 31.613 |
| | - | - | - | - | - |

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| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| -- Coordinate with ONR and NUWC Newport to develop FNCs to a high technology readiness level and transition to EW systems as appropriate. -- Develop advanced technology demonstrations for feasibility. FY 2022 OCO Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: Funding increases in FY22 by \$1.632M to conduct the next step of the EW digital transformation and is performed in coordination with the rest of the SWFTS programs. Additionally, this funding completes engineering and manufacturing of mature system development tasks for integration of TI-22 capabilities which consists of two baselines on the SEAWOLF Class and 688 Class submarines. Completing this integration is crucial in providing 688 and SEAWOLF submarines with the next generation of tactical advantages. | | | | | |
| Accomplishments/Planned Programs Subtotals | 20.403 | 29.981 | 31.613 | 0.000 | 31.613 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| <u>Line Item</u> | <u>FY 2020</u> | <u>FY 2021</u> | <u>FY 2022 Base</u> | <u>FY 2022 OCO</u> | <u>FY 2022 Total</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>FY 2026</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
| • OPN/0840: Sub Periscope, Imaging and Supt Equip Prog | 160.803 | 190.954 | 234.932 | - | 234.932 | - | - | - | - | - | - |

Remarks

D. Acquisition Strategy
 AN/BLQ-10 EW System - Procurements are executed/managed in accordance with Acquisition Plan (Rev 10) for AN/BLQ-10 EW System dtd 02/01/17, Single Acquisition Management Plan dtd 06/12/14, Individual Streamlined Acquisition Plan (Rev 0) for AN/BLQ-10 dtd 04/09/18, and the AN/BLQ-10 Acquisition Strategy dtd 01/28/13.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

| | | |
|--|---|--|
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | Project (Number/Name) 0775 / Submarine Supt Equip Prog |
|--|---|--|

| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 and Software Development | Various | Various : Various | 5.172 | 0.679 | Oct 2019 | 0.693 | Oct 2020 | 0.707 | Oct 2021 | - | | 0.707 | - | - | - |
| Hardware and Software Development | WR | NUWC : Newport, RI | 19.504 | 0.782 | Oct 2019 | 0.797 | Oct 2020 | 0.812 | Oct 2021 | - | | 0.812 | - | - | - |
| H/W and S/W Development MMM Payload | C/FFP | SEACORP : Newport, RI | 6.570 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | - | - | - |
| H/W and S/W Development EW TI/APB | C/CPIF | Lockheed Martin : Syracuse, NY | 16.061 | 17.052 | Oct 2019 | 23.962 | Oct 2020 | 26.626 | Oct 2021 | - | | 26.626 | - | - | - |
| PATRIOT Phase C Development | C/CPIF | Lockheed Martin : Syracuse, NY | 0.000 | 0.000 | | 2.600 | Oct 2020 | 1.500 | Oct 2021 | - | | 1.500 | - | - | - |
| Subtotal | | | 47.307 | 18.513 | | 28.052 | | 29.645 | | - | | 29.645 | - | - | N/A |

Remarks
Prime integrator of the PATRIOT Phase C technology was changed to Lockheed Martin with NAWC China Lake providing support.

| Test and Evaluation (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 | | | |
| Test Support | WR | COTF : Norfolk, VA | 1.384 | 0.330 | Oct 2019 | 0.337 | Oct 2020 | 0.344 | Oct 2021 | - | | 0.344 | - | - | - |
| Systems Engineering & Test Support | WR | NUWC : Newport, RI | 12.920 | 1.560 | Oct 2019 | 1.592 | Oct 2020 | 1.624 | Oct 2021 | - | | 1.624 | - | - | - |
| Subtotal | | | 14.304 | 1.890 | | 1.929 | | 1.968 | | - | | 1.968 | - | - | N/A |

| Project Cost Totals | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|--------------------|----------------|----------------|---------------------|--------------------|----------------------|-------------------------|-------------------|---------------------------------|
| | 61.611 | 20.403 | 29.981 | 31.613 | - | 31.613 | - | - | N/A |

Remarks
Prime integrator of the PATRIOT Phase C technology was changed to Lockheed Martin with NAWC China Lake providing support.

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| | | |
|---|---|--|
| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy | | Date: May 2021 |
| Appropriation/Budget Activity 1319 / 5 | R-1 Program Element (Number/Name) PE 0604503N / SSN-688 & Trident Modernization | Project (Number/Name) 0775 / Submarine Supt Equip Prog |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Proj 0775 | | | | |
| Developments: PATRIOT Phase C: | 1 | 2021 | 1 | 2022 |
| Developments: EW TI/APB Development: EW TI/APB Development: TI-20 | 1 | 2020 | 2 | 2021 |
| Developments: EW TI/APB Development: EW TI/APB Development: TI-22 | 3 | 2021 | 4 | 2022 |
| Test and Evaluation: EWTU OPEVAL | 4 | 2020 | 4 | 2020 |
| Test and Evaluation: TI-18/APB-19: Developmental Testing | 2 | 2021 | 2 | 2021 |
| Test and Evaluation: TI-18/APB-19: Operational Testing | 1 | 2022 | 1 | 2022 |
| Test and Evaluation: PATRIOT Phase C Developmental Testing | 2 | 2022 | 2 | 2022 |
| Test and Evaluation: TI-20/APB-19: Developmental Testing | 3 | 2022 | 3 | 2022 |
| Test and Evaluation: TI-20/APB-19: Operational Testing | 4 | 2022 | 4 | 2022 |