| Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy | | | | | | | | | | | Date: March 2019 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)* | | | | | R-1 Program Element (Number/Name)<br>PE 0603582N *I Combat System Integration* | | | | | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2018** | **FY 2019** | **FY 2020 Base** | **FY 2020 OCO** | **FY 2020 Total** | **FY 2021** | **FY 2022** | **FY 2023** | **FY 2024** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 408.784 | 15.471 | 16.351 | 17.251 | - | 17.251 | 16.015 | 15.509 | 15.826 | 16.142 | Continuing | Continuing |
| 0164: *Combat System Integration* | 408.784 | 15.471 | 16.351 | 17.251 | - | 17.251 | 16.015 | 15.509 | 15.826 | 16.142 | Continuing | Continuing |

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

Chief of Naval Operations (CNO) created the Navy's Strike Force Interoperability (SFI) program in 1998 in response to critical shortfalls in the introduction of integrated and interoperable System of Systems (SoS) to deploying Strike Forces. Interoperability concerns still exist today as new systems are introduced to the Fleet, interoperating with older systems, and the complexity of the Systems of Systems integration has continued to increase. These programs help prevent the situation that occurred in 1998 by catching those critical shortfalls before the systems are released to the Fleet. Warfighters depend on these programs on a daily basis to remove or reduce the interoperability risk associated with the systems they are tasked to operate. Commander, Naval Sea Systems Command (COMNAVSEA) acts as management lead for Joint System Command (SYSCOM) system certification policy and guidance and certifies platforms for interoperability within the platform and throughout the enterprise, in accordance with Commander, US Fleet Forces Command/Commander, Pacific Fleet COMUSFLTFORCOM/COMPACFLT) Ins. 4720.3C dated 18 SEP 2017 (C5ISR Modernization Policy). COMUSFLTFORCOM/COMPACFLT INST. 4720.3C also requires that COMNAVSEA act as administrative agent for Naval Information Forces (NAVIFOR) Command and Control, Communications, Computers, Combat Systems, Intelligence, Surveillance and Reconnaissance Modernization Process (C5IMP), and execution agent for Navy Command and Control, Communications, Computers, Combat Systems, Intelligence, and Surveillance and Reconnaissance Modernization Council (NCMC). This program conducts Interoperability Assessments that are required to certify Aircraft Carriers, Amphibious Assault Ships, and Surface Combatants in accordance with the Naval Warfare System Certification Policy (NWSCP) NAVSEAINST 9410.2A, NAVAIR 5230.20, AND SPAWAR 5234.1). The SFI program ensures overall Strike Force Interoperability is characterized and assessed. COMNAVSEA is assigned central United States Navy (USN) responsibility for interoperability, directing the development of policy and architecture for Strike Force Warfare Systems engineering and implementation of common warfare systems engineering processes.

There are three priorities within the Strike Force Interoperability Program:

(1) Support Fleet "as-is" state which includes Navigation System Certification (NAVCERT), Strike Group Interoperability (SGI) Capabilities & Limitations (CAPS&LIMS), and Interoperability Tactical Information Coordinator Technical Aids (TIC TECHAIDs). These functions provide the critical review, assessment and documentation to properly inform the warfighter of the status of the interoperability for the systems they operate.

(2) Support Ship's system modernization (non-HME) including warfighting capability & other C5I upgrades including C5IMP Baseline Management. These functions ensure the warfighter is provided integrated and interoperable fielded systems to fulfill mission success.

(3) Support Ship Warfare System Certification & Force Level Assessments. This includes Warfare Systems Certification, Interoperability Certification, Force Level Interoperability Analysis, & Assessments, Cybersecurity Assessments and recommendations for improvements to the program offices for implementation at the systems'

level. This critical function provides the confidence to the warfighter they are getting the best possible systems and that through the certification process the systems have been properly tested and assessed to ensure the best possible interoperability.

Project 0164 Combat System Integration:
This project consists of five key Pillars executed within the Strike Force Interoperability (SFI) Program:

(1) Command & Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP). The C5IMP validates the introduction of new systems and upgrades to existing systems into the fleet and ensures systems' maturity prior to shipboard installation thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups.

(2) Warfare Systems Certification (WSCERT), which is essential to validating the maturity and operational performance of warfare systems prior to Fleet delivery and deployment.

(3) The integrated Navigation System Certification (NAVCERT) program certifies the shipboard integrated navigation suite for safe navigation using the Electronic Charting and Display Information System Navy (ECDIS-N) as the primary plot. To support Strike Force Interoperability and ship's mission requirements, it ensures that the installed integration navigation suite provides accurate and timely navigation information (position, velocity, speed, heading, roll, and pitch) to all navigation data consumers (Warfare/Weapons Systems, Control Systems, and precision approach and landing systems). This ensure the safe maneuver of naval forces to execute missions throughout the full spectrum of conflict.

(4) Interoperability Certification and Assessment (IOP C&A) is the critical independent assessment of strike group warfare systems operational performance. Interoperability assessment examines force level engagement threads, aircraft control, air battle management, and operational displays to ensure the warfighter is being provided the most interoperable systems available. Assessments of deploying ships in strike force configurations are accomplished through the use of the Navy's Distributed Integration and Interoperability Assessment Capability (DIIAC) which supports the Deputy Assistant Secretary of the Navy (DASN) "shift to the left" policy by providing early interoperability testing in the acquisition lifecycle. It is a Commander, U.S. Fleet Forces Command (CFFC) and Commander U.S. Pacific Fleet (COMPACFLT) requirement that all strike forces undergo interoperability assessment testing in the DIIAC prior to deployment. The support for DASN and requirements of the combatant commander cannot be accomplished without the full funding of these programs. Interoperability certification results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) documentation and Tactical Information Coordinator Technical Aids (TIC TECHAIDS)) on which the warfighters rely daily, that ensure that systems' operators understand the interoperability capabilities and limitations of their combat systems, as well as all units within the networked architecture, and have the watch station tools necessary for the execution of their tactical responsibilities. These are Fleet desired and NAVSEA required programs that must be fully funded to ensure the warfighter awareness of Strike Force Interoperability.

(5) Cybersecurity Certification and Assessment (CYBER C&A), the assessment of systems' cybersecurity, as directed by OPNAV memorandum 5400 Ser N2N6/4U1119089, including compliance with DODi 8500.01 for each warfare system element, identifies vulnerabilities at both the element, system and enclave levels, and assesses a ship's IT/IA Cybersecurity posture in support of Warfare Systems Certification IAW the NAVSEAINST 9410.2 (series). Assessments of deploying ships in strike force configurations for its Cybersafe Readiness are accomplished through the use of the Navy's USS Secure environment leveraging existing navy labs

| Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy | Date: March 2019 |
|---|---|
| **Appropriation/Budget Activity**<br>1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)* | **R-1 Program Element (Number/Name)**<br>PE 0603582N *I Combat System Integration* |

and DOD Cyber Ranges and Fleet exercises using the cyber table top technique, red team, blue team, and cyber specific metrics/measure analysis to evaluate the system's and enclaves' ability to detect, react and response to achieve its warfare mission requirement. System commands and programs of record also use these cyber assessments to guide their development of specific procedures for immediate response to cyber threats while maintaining maximum operational effectiveness. The cyber assessment results and ship systems and enclaves response procedures are also used to develop Fleet Cyber Tactical Tools (Capabilities & Limitations (CC&L) documentation and Cyber Tactical Technical Aids (CYBER TECHAIDS)), to ensure that systems' operators understand the capabilities and limitations of their combat systems and have the watch station tools necessary for the execution of their tactical responsibilities under various cyber threat conditions.

| B. Program Change Summary ($ in Millions) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| Previous President's Budget | 24.674 | 16.351 | 27.921 | - | 27.921 |
| Current President's Budget | 15.471 | 16.351 | 17.251 | - | 17.251 |
| Total Adjustments | -9.203 | 0.000 | -10.670 | - | -10.670 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -0.403 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -10.670 | - | -10.670 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | 0.000 | - | 0.000 |
| • Congressional Directed Reductions Adjustments | -8.800 | - | - | - | - |

**Change Summary Explanation**

FY18: Funding reduced by $4.400M due to Proj 3425 Digital Warfare Office (DWO) moved to new RDT&EN PE 0604027N.
FY18: Funding reduced by $4.400M due to Digital Warfare Office (DWO) program termination within Proj 0164 Combat System Integration.
FY18: Funding reduced by $0.403M to support the Small Business Innovative Research (SBIR) program.
FY20: Program reduced to support higher departmental needs.

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | | | | | | | | | | Date: March 2019 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 4 | | | | | R-1 Program Element (Number/Name)<br>PE 0603582N / *Combat System Integration* | | | | Project (Number/Name)<br>0164 / *Combat System Integration* | | | |
| **COST ($ in Millions)** | **Prior Years** | **FY 2018** | **FY 2019** | **FY 2020 Base** | **FY 2020 OCO** | **FY 2020 Total** | **FY 2021** | **FY 2022** | **FY 2023** | **FY 2024** | **Cost To Complete** | **Total Cost** |
| 0164: *Combat System Integration* | 408.784 | 15.471 | 16.351 | 17.251 | - | 17.251 | 16.015 | 15.509 | 15.826 | 16.142 | Continuing | Continuing |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

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

Project 0164: Combat System Integration:

This project consists of five key Pillars executed within the Strike Force Interoperability (SFI) Program:

(1) Command & Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP). The C5IMP validates the introduction of new systems into the fleet and ensures systems' maturity prior to shipboard installation thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups.

(2) Warfare Systems Certification (WSCERT), which is essential to validating the maturity and operational performance of warfare systems prior to Fleet delivery and deployment.

(3) The integrated Navigation System Certification (NAVCERT) program certifies the shipboard integrated navigation suite for safe navigation using the Electronic Charting and Display Information System Navy (ECDIS-N) as the primary plot. To support Strike Force Interoperability and ship's mission requirements, it ensures that the installed integration navigation suite provides accurate and timely navigation information (position, velocity, speed, heading, roll, and pitch) to all navigation data consumers. This supports the following mission critical functions: pre-launch aircraft alignment, safe aircraft precision approach and landing operations, and accurate warfare/weapon systems targeting.

(4) Interoperability Certification and Assessment (IOP C&A), the independent assessment of strike group warfare systems operational performance. Interoperability assessment examines force level engagement threads, aircraft control, air battle management, and operational displays. Assessments of deploying ships in strike force configurations are accomplished through the use of the Navy's Distributed Integration and Interoperability Assessment Capability (DIIAC) which supports the Deputy Assistant Secretary of the Navy (DASN) "shift to the left" policy by providing early interoperability testing in the acquisition lifecycle. It is a Commander, U.S. Fleet Forces Command (CFFC) and Commander U.S. Pacific Fleet (COMPACFLT) requirement that all strike forces undergo interoperability assessment testing in the DIIAC prior to deployment. Interoperability certification results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) documentation and Tactical Information Coordinator Technical Aids (TIC TECHAIDS)), that ensure that systems' operators understand the interoperability capabilities and limitations of their combat systems and have the watch station tools necessary for the execution of their tactical responsibilities.

(5) Cybersecurity Certification and Assessment (CYBER C&A), the assessment of systems' cybersecurity, as directed by OPNAV memorandum 5400 Ser N2N6/4U1119089, including compliance with DODi 8500.01 for each warfare system element, identifies vulnerabilities at both the element, system and enclave levels, and assesses a ship's IT/IA Cybersecurity posture in support of Warfare Systems Certification IAW the NAVSEAINST 9410.2 (series). Assessments of deploying

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

ships in strike force configurations for its Cybersafe Readiness are accomplished through the use of the Navy's USS Secure environment leveraging existing navy labs and DOD Cyber Ranges and Fleet exercises using the cyber table top technique, red team, blue team, and cyber specific metrics/measure analysis to evaluate the system's and enclaves' ability to detect, react and response to achieve its warfare mission requirement. System commands and programs of record also use these cyber assessments to guide their development of specific procedures for immediate response to cyber threats while maintaining maximum operational effectiveness. The cyber assessment results and ship systems and enclaves response procedures are also used to develop Fleet Cyber Tactical Tools (Capabilities & Limitations (CC&L) documentation and Cyber Tactical Technical Aids (CYBER TECHAIDS)), to ensure that systems' operators understand the capabilities and limitations of their combat systems and have the watch station tools necessary for the execution of their tactical responsibilities under various cyber threat conditions.

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| ***Title:*** Navigation System Certification (NAVCERT) | 1.069 | 1.335 | 1.117 | 0.000 | 1.117 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Modern warfare systems installed in US Navy ships require accurate position and time to achieve required effects. At the strike force level, accurate position and time are required to enable interoperability of warfighting systems of systems. The Integrated Navigation Suite Certification (NAVCERT) pillar of SFI certifies the accuracy of ship's position information, and verifies that it is properly distributed to sensors and weapons systems installed in US Navy ships. Certification is required at five-year intervals, following Chief of Naval Operations Availabilities greater than six months, in support of Precision Approach and Landing System (PALS) certification, or when configuration changes have been made to the ships integrated navigation suite. Certification testing verifies the accuracy of sensors that determine heading, velocity, attitude, and position; and validates receipt of navigation data by all- consuming systems including Integrated Warfare (or Mission) Systems, Aircraft Inertial Alignment System, and Control Systems. The scope of the certification includes all inertial navigation system equipment as well as the Electronic Chart Display and Information System - Navy (ECDIS- N). Forecasting out year NAVCERT requirements is based on the projection of expiring certifications, scheduled maintenance availabilities, and modernization of installed integrated navigation systems. Wherever possible, the program leverages integrated navigation suite modernization efforts to reduce overall program costs. | | | | | |
| ***FY 2019 Plans:***<br>Conduct 36 scheduled NAVCERTs on Cruisers, Destroyers, Aircraft Carriers, and Amphibious Ships. Verify accuracy of ships heading, velocity, attitude, and position data and validated receipt by all integrated warfare systems. Document discrepancies and assess risk to safety of navigation and warfighting missions. | | | | | |
| ***FY 2020 Base Plans:***<br>Conduct 24 scheduled NAVCERTs on Cruisers, Destroyers, Aircraft Carriers, and Amphibious Ships. Verify accuracy of ships heading, velocity, attitude, and position data and validated receipt by all integrated warfare systems. Document discrepancies and assess risk to safety of navigation and warfighting missions. Conduct | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| scheduled NAVCERTS on USN Surface ships. Continue to achieve cost efficiencies by leveraging test results from conjunctive alterations to navigation systems during modernization periods.<br>***FY 2020 OCO Plans:***<br>N/A<br>***FY 2019 to FY 2020 Increase/Decrease Statement:***<br>Decrease due to lower amount of NAVCERTs. | | | | | |
| ***Title:*** Command , Control, Communications, Computers, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP)<br>***Articles:***<br>***Description:*** Achieving and maintaining Strike Force Interoperability requires disciplined engineering, system integration, and configuration management at both the platform (ship or shore station) and strike force level (Carrier Strike Group/ Amphibious Readiness Group). The Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, Reconnaissance (C5ISR) Modernization Program (C5IMP) pillar of SFI ensures deploying strike force ships receive modernized and interoperable warfighting capabilities in order to meet theater operational requirements. This project funds engineering assessments of proposed C5I capability improvements to determine maturity for installation as well as technical and schedule risk associated with proposed hardware and software changes. This project directly supports requirements of the Fleet C5I Modernization Policy (per COMUSFLTFORCOM/COMPACFLT Inst. 4720.3) which assigns responsibilities to NAVSEA 05H to assess operational risks associated with C5ISR modernization in both afloat and ashore units in support of the Optimized Fleet Response Plan (OFRP). The deliverables of this project are created by determining the maturity, through engineering analysis, of the critical linchpins needed to achieve interoperability for each proposed C5IMP capability improvement item to be installed in a ship's baseline, developing installation recommendations of C5I system upgrades for the Fleet Commanders, and researching and analyzing installation or operating problems. Failure to achieve required maturity for one system that is part of an interoperable warfare system package can prevent this system from being installed, thus breaking the capability planned for the entire original warfare package, which will impact Strike Group warfighting capabilities. There is close coordination with the FLTCDRs and TYCOMs as well as other members of the C5IMP community to address, coordinate, and resolve C5IMP modernization issues thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups. Focus is on key milestones such as Baseline Locking Events (BLEs) and Planned Not Authorized (PNA) reviews, and SG/ARG Analysis Reports which are Fleet required events. The BLEs, PNA Reviews, and SG/ARG Analysis Reports are the primary work products in the C5IMP process. Additionally, due to emerging warfighting requirements and the development of required hardware and | 1.834<br>- | 2.093<br>- | 2.208<br>- | 0.000<br>- | 2.208<br>- |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| software changes between CNO Availability periods, an electronic change control board has been developed (BFI-CCB) to facilitate the request, review and approval of proposed Baseline changes.<br><br>Forecasting C5ISR requirements and schedules is based on the projection of ships' operating/maintenance schedules at the particular point in time. Due to changing operational needs, these schedules frequently change causing availability extensions, deferrals, cancellations, or delays. The supporting C5IMP/C5ISR schedules must adjust accordingly, resulting in regular modifications to the numbers of events/requirements projected for C5IMP/C5ISR from period to period. C5ISR Configuration Control is maintained and updated continuously for every ship. Maintenance of the Afloat Master Planning System (AMPS) data for the approximately 285 active Battle Force ships, along with establishing initial configurations for the New Construction ships entering the Fleet each year is essential and a major effort. This data is extracted and formatted to develop the BLE and PNA Review presentations which enable the Fleet commanders and TYCOMs to make informed modernization decisions. Additionally, numerous data calls are requested each month to answer configuration queries and perform studies utilizing AMPS data. CUSFFC/CPF Instruction 4720.3C designates NAVSEA 05H4 as the executing agent for the two NCMCs held each year. This requires C5IMP personnel to make all logistical and administrative arrangements for the 150+ attendees, collect and present all briefs, set up VTC and phone centers for remote attendees, and maintain all associated records for these councils. Fleet Commanders, TYCOMs, SYSCOMs and supporting personnel gather at NCMCs to discuss advance plans, coordinate near term modernization plans, coordinate shore and shipboard installations to ensure support prior to deployments, resolve schedule issues and establish priorities. Action items are recorded and tracked by NAVSEA, and major issues are reported to a joint FFC/CPF flag/SES panel.<br><br>***FY 2019 Plans:***<br>1. Facilitate reviews, assessments, and execution of C5ISR installations during approximately 76 CNO Availabilities.<br>2. Review approximately 700 warfare system Ship Change Documents. Assess impact to Strike Force Interoperability. Create and maintain database entries for approximately 1,000 new software and hardware upgrades to be entered and tracked in the Afloat Master Planning System (AMPS), the fleets authoritative database for C5I modernization.<br>3. Plan and execute two 2 NCMCs. Identify and resolve fleet warfare system modernization issues.<br>4. Conduct 12 Monthly Baseline Locking Events where 92 Ships' Baselines will be reviewed and locked and 12 monthly PNA Review Meetings where the PNA status of 82 Ships will be reviewed. | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
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| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| 5. Provide 2 SG/ARG Analysis Reports. Analyze assigned strike force mission areas. Identify misalignments in warfare system modernization planning that result in strike force interoperability issues that degrade primary/ secondary missions and develop recommendations to resolve.<br>6. Evaluate, comment on, and process approximately 2300 proposed Baseline changes via the Electronic Change Control Board process (BFI-CCB). These changes will include requests for addition of new hardware and software to ships, deletion from planned installations, and TCD Waiver requests.<br>7. Establish initial warfare system baselines for 9 new construction ships. | | | | | |
| ***FY 2020 Base Plans:***<br>1. Facilitate reviews, assessments, and execution of C5ISR installations during approximately 81 CNO Availabilities.<br>2. Review approximately 820 warfare system Ship Change Documents. Assess impact to Strike Force Interoperability. Create and maintain database entries for approximately 1,300 new software and hardware upgrades to be entered and tracked in the Afloat Master Planning System (AMPS), the fleets authoritative database for C5I modernization.<br>3. Plan and execute 2 NCMCs. Identify and resolve fleet warfare system modernization issues.<br>4. Conduct 12 Monthly Baseline Locking Events where 105 Ships' Baselines will be reviewed and locked and 12 monthly PNA Review Meetings where the PNA status of 94 Ships will be reviewed.<br>5. Provide 2 SG/ARG Analysis Reports. Analyze assigned strike force mission areas. Identify misalignments in warfare system modernization planning that result in strike force interoperability issues that degrade primary/ secondary missions and develop recommendations to resolve.<br>6. Evaluate, comment on, and process approximately 2500 proposed Baseline changes via the Electronic Change Control Board process (BFI-CCB). These changes will include requests for addition of new hardware and software to ships, deletion from planned installations, and TCD Waiver requests.<br>7. Establish initial warfare system baselines for 8 new construction ships. | | | | | |
| ***FY 2020 OCO Plans:***<br>N/A | | | | | |
| ***FY 2019 to FY 2020 Increase/Decrease Statement:***<br>Increase due to increase in size of fleet as well as increase in number of C5I changes planned/proposed. CNO availabilities increase by 5%, C5I Ship Change Documents increases by 17%, and proposed C5I changes to ships warfare systems increases by 13%. Additionally, revised COMUSFLTFORCOM/COMPACFLT Instruction 4720.3 tasks NAVSEA to perform Strike Group/ Amphibious Readiness Group (SG/ARG) Analysis to identify | | | | | |

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| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| misalignments in warfare system modernization planning that result in strike force interoperability issues that degrade primary/secondary missions. | | | | | |
| ***Title:*** Interoperability Certification and Assessment | 8.870 | 10.469 | 11.336 | 0.000 | 11.336 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** This warfare critical project funds interoperability assessments via the Distributed Integration & Interoperability Assessment Capability (DIIAC), the technical assessment of interoperable systems to meet mission requirements, the updating of Strike Group Capabilities and Limitations (C&L) and the updating of the Tactical Information Coordinator Technical Aids (TIC TECHAIDs). The project ensures NAVSEA/PEOs are delivering mature and interoperable warfare systems at the platform and Strike Group levels to the warfighter, with NAVSEA providing Strike Force interoperability certification and assessments. This project focuses on force-level impact of new systems and platforms under development. Interoperability Assessments of deploying ships in Strike Force configurations are accomplished through the utilization of the Navy's DIIAC, located at multiple Navy land-based sites located across the country and connected via networking technology, and that provides operational configurations for all naval combat systems. It is a U.S. Fleet Forces Command requirement that all Strike Forces undergo Interoperability Assessment Testing in the DIIAC prior to deployment. The DIIAC provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and Strike Groups. DIIAC, with its ability to test systems in a Strike Group environment, is funded to support the warfare system's acquisition community to test their developmental items for interoperability. However, in this instance, while funds are provided to test the item in a Strike Group environment, funds are not provided for subsequent data analysis and risk assessment, as this is the cognizant acquisition program's responsibility. When the acquisition development is complete and corrections are made, DIIAC will then fund for the full interoperability certification testing of the baseline to include the requisite warfare system analysis and risk assessments needed to obtain an Interoperability Certification.<br><br>Note, this effort also supports and feeds into the development of Fleet Tactical Tools such as Capabilities & Limitations (C&L) and Tactical Information Coordinator Technical Aids (TIC TECHAIDs), which are relied on daily to ensure that operators/warfighters understand the interoperability capabilities and limitations of their combat and C5I systems. C&Ls are published for all Strike Groups, Independent Deployers, and (when funded) their Coalition and Joint partners. TIC TECHAIDS are delivered to deploying Carrier Strike Groups (CSG's), Amphibious Ready Group (ARG's) and Independent Deployers prior to workups and then a final copy is provided prior to deployment. C&L and TIC TECHAIDS are the final report-out to Fleet operators/warfighters of the acquisition community's efforts. They are used on a daily basis and relied upon in every operational theater, | | | | | |

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| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| as well as in every Navy and Joint Schoolhouse. Note, the DIIAC infrastructure is available, but not funded to support the surface Navy's participation in the Joint Testing Environments as well as the Maritime Theater Missile Defense (MTMD) Coalition Forces interoperability testing.<br><br>***FY 2019 Plans:***<br>1. Conduct 3 Interoperability Land-Based test events including the following:<br>-Development interoperability test to support for ACS 7.2.3 (IFF Mode 5 only); AEGIS 5.4; ACS 9.C2.1 (B27); ACS 9.A2.1 (B27); ACS 9.C2.2 (B30); SSDS 10.11.00; SSDS 6.06.04 (IFF Mode 5 only); SSDS 9.08.06 (IFF Mode 5 only); LCS Freedom BL 3.1 QA8 (IFF Mode 5 only); and DDG 1000 (B8.5)<br>-Certification Interoperability test for ACS 9.C2.1 (B27); ACS 9.A2.1 (B27); SSDS 10.11.01; and DDG 1000 (B8.5)<br>-Certification Interoperability Risk assessment & Report for ACS 9.C2.0 (B24) and ACS 7.2.2 (IFF Mode 4 Inoculation); ACS 7.2.3 (IFF Mode 5)<br>2. Complete C&L and TIC TECHAIDS, normally a near constant yearly demand requirement, also addressed AEGIS Ashore. This will result in updates to Interoperability C&L for:<br>-23 Deploying Strike Group Ships (from a database containing 185 U.S. Surface Ships),<br>-10 Naval Air Squadrons (covering F/A-18s, F-35, E-2Cs, E-2Ds, MH-60Ss, MH-60Rs, EA-6Bs, EA-18Gs, P-3Cs and P-8As),<br>-AEGIS Ashore (Romania, Poland(update) and Pacific Missile Range Facility(update).<br>3. Provide annual deliveries of Initial/Draft/Final TIC TECHAIDS to:<br>-3 Carrier Strike Groups (CSG's) Sixteen (16) Ships<br>-4 Amphibious Ready Group's (ARG's) Eight (8) Ships<br>-31 BMD Ships<br>-14 Forward Deployed Naval Force (FDNF) Ships<br>-53 Independent Deploying Ships (CVN, CG, DDG, LCCS and LCS)<br>-Aegis Ashore Site (Romania)<br>-Four (4) Fleet Area Control and Surveillance Facilities (FACSFAC's)<br>-Six (6) Fleet Maritime Operations Centers (MOC's) sites.<br>4. Plan to conduct engineering to support two (2) systems Verification and Validation Tests.<br><br>***FY 2020 Base Plans:***<br>1. Conduct 3 Interoperability Land-Based test events including the following:<br>-Development interoperability test to support for ACS 9.C2.2 (B30); SSDS 10.11.02 (CVN Configuration); SSDS B/L 11.X (ACB 20); and DDG 1000 (B8.7) | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| -Certification Interoperability test for ACS 9.C2.2 (B30); AEGIS 5.4; SSDS 10.11.02 (CVN Configuration); and DDG 1000 (B8.7)<br>-Certification Interoperability Risk assessment & Report for ACS 9.C2.1 (B27); ACS 9.A2.1 (B27); AEGIS 5.4; SSDS 10.11.01; SSDS 6.06.04 (IFF Mode 5 only); SSDS 9.08.06 (IFF Mode 5 only); LCS Freedom BL 3.1 QA8 (IFF Mode 5 only); and DDG 1000 (B8.5)<br><br>(Note: Testing of all new Combat Systems will include IFF Mode 5 testing)<br>***FY 2020 OCO Plans:***<br>N/A<br>***FY 2019 to FY 2020 Increase/Decrease Statement:***<br>Increase due to requirement growth in full baselines receiving test and IOP Certification (two full IOP certs completing in FY19, five full IOP certs completing in FY20) and increase in test and IOP certification of back fit installs of IFF Mode 5 (one IFF Mode 5 IOP Cert completes in FY19, three IFF Mode 5 IOP certs complete in FY20). | | | | | |
| ***Title:*** Warfare Systems Certification | 2.725 | 2.454 | 2.590 | 0.000 | 2.590 |
| ***Articles:*** | - | - | - | - | - |
| ***Description:*** Strike Force Interoperability (SFI) begins with properly engineered warfare systems installed in US Navy Ships. The Warfare Systems Certification (WSCERT) pillar of SFI certifies that modernized warfare systems are ready for installation, properly installed, and meet warfighting mission area requirements, to include the systems' interoperability and functional integration within the Strike Force that enables successful mission accomplishment. It funds the collection and independent technical assessment of that interoperability and integration using empirically derived Objective Quality Evidence (OQE) that installed warfare systems meet required performance specifications. Using established evaluation criteria, the project assesses the maturity of proposed warfare system modernizations prior to installation and certifies readiness of modernized warfare systems for operational deployment in ships, either independently or as components of Carrier/Expeditionary Strike Groups. When evaluation criteria are not met, the program funds the development and approval of operational risk assessments. This includes conducting an analysis of all work-arounds documented in Tactics, Techniques, and Procedures (TTPs), Capabilities & Limitations (C&L), and Trouble Reports (TR) to ensure that aggregate deficiencies and work-arounds do not render the warfare system, to include the operator, ineffective. NAVSEA accomplishes these efforts through a sequential series of technical reviews that begin 18-36 months prior to a scheduled modernization of a ship's warfare system, which includes development of a Warfare System Certification Plans (WSCP), conduct of Warfare Systems Certification Readiness Reviews (WSCRR), conduct | | | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| of Warfare Systems Installation Assessments (WSIA), and prior to deployment, conduct of a Warfare Systems Certification Decisions (WSCD).<br><br>***FY 2019 Plans:***<br>1. Develop, analyze and maintain scheduling and installation data required for the conduct of Warfare Systems Certification events for a subset of 20 Criteria for 101 ships, including efforts for the conduct of approximately 163 Warfare Systems Certification Events (WSIAs, and WSCDs), and development of 77 WSCPs for applicable ship classes. (Planned Certification Event increases enabled by efficiencies developed and implemented in FY18.)<br>2. Update the current NWSCP instruction and implement the resulting revised Naval Warfare Systems Certification Policy.<br>3. Continue to strive for further WSCERT execution efficiencies through workforce streamlining initiatives, criteria management and consolidation of WSCERT events, and improved knowledge management tools. FY19 Goal is to achieve efficiencies of 5%.<br><br>***FY 2020 Base Plans:***<br>1. Develop, analyze and maintain scheduling and installation data required for the conduct of Warfare Systems Certification events for a subset of 20 criteria for 110 ships, including efforts for the conduct approximately 130 Warfare Systems Certification Events (WSIAs, and WSCDs) and development of WSCPs for applicable ship classes.<br>2. Full implementation and assessment of efficiencies identified in FY19.<br>3. Continue to strive for WSCERT execution efficiencies through workforce streamlining initiatives, criteria management and consolidation of WSCERT events.<br><br>***FY 2020 OCO Plans:***<br>N/A<br><br>***FY 2019 to FY 2020 Increase/Decrease Statement:***<br>Increase due to 10% increase in number of ships requiring certification events, and maintaining the associated configuration, installation schedules, and Strike Group composition associated with that increase along with the other 101 ships. Related, but less significant are the annual events' costs adjustments from the previous year. Full impact of increased number of certification events mitigated in part through efficiencies identified in FY19. | | | | | |
| ***Title:*** Warfare Systems Cybersecurity | 0.973 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Articles:*** | - | - | - | - | - |

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each) | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total |
|---|---|---|---|---|---|
| ***Description:*** The required assessment and characterization of aggregate levels of risk for ships is specified to be accomplished at the Warfare Systems System of Systems (SoS) level and will be part of the requirements identified in the Naval Warfare Systems Certification of Navy Aircraft Carriers and Surface Combatants. Cybersecurity assessment activities began FY16.<br><br>Cybersecurity Assessment at the SoS level will entail:<br><br>1. Establishing and collecting metrics to characterize Warfare Systems ability to protect, detect, react, and restore capabilities, as well as analyze the mission effects induced by the cyber threat activity.<br><br>2. Maintain, improve and refine the methodologies, tools, and techniques used to conduct such risk assessments appropriate to ship warfare systems baselines and representative strike group interoperability requirements.<br><br>3. Conduct an assessment of developmental and operational warfare systems.<br><br>***FY 2019 Plans:***<br>N/A<br><br>***FY 2020 Base Plans:***<br>N/A<br><br>***FY 2020 OCO Plans:***<br>N/A | | | | | |
| **Accomplishments/Planned Programs Subtotals** | 15.471 | 16.351 | 17.251 | 0.000 | 17.251 |

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

| Line Item | FY 2018 | FY 2019 | FY 2020 Base | FY 2020 OCO | FY 2020 Total | FY 2021 | FY 2022 | FY 2023 | FY 2024 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • OPN 2960: *ICSTF: Integrated Combat System Test Facility* | 5.019 | 6.251 | 6.167 | - | 6.167 | 5.981 | 6.135 | 6.276 | 0.000 | 0.000 | 79.751 |

**Remarks**

| Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

**D. Acquisition Strategy**

RDTEN funding under this line supports independent certification of the integration of major capability upgrades acquired by Program Executive Offices (PEOs) into host Navy Platforms and Strike Forces. The RDTEN engineering and certification activities at field sites do not involve direct procurement of equipment or engineering services, and hence no acquisition strategy is required. The major capability upgrades evaluated under this program fall under their associated PEOs' acquisition strategies.

**E. Performance Metrics**

Quarterly Program Reviews and Baseline Assessments

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy | | | Date: March 2019 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 4 | R-1 Program Element (Number/Name)<br>PE 0603582N / *Combat System Integration* | Project (Number/Name)<br>0164 / *Combat System Integration* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2018 Cost | FY 2018 Award Date | FY 2019 Cost | FY 2019 Award Date | FY 2020 Base Cost | FY 2020 Base Award Date | FY 2020 OCO Cost | FY 2020 OCO Award Date | FY 2020 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SF Requirements Engineering & Analysis | WR | NSWCs : DN/PHD/ Corona | 5.157 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.157 | - |
| SF Requirements Engineering & Analysis | WR | Non-NSWCs : Various | 5.295 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.295 | - |
| Platform/Strike Force Certification | WR | NSWCs : DD/ICSTD/ DN/Corona | 39.732 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 39.732 | - |
| Platform/Strike Force Certification | WR | Non-NSWCs : Various | 27.843 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 27.843 | - |
| Fleet Response Plan (FRP) | WR | NSWCs : DD/PHD/ DN | 27.030 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 27.030 | - |
| Fleet Response Plan (FRP) | WR | Non-NSWCs : Various | 3.793 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.793 | - |
| Combat Systems Cert ISO Platform Cert | WR | NSWCs : DN/DD/ PHD/Corona | 24.640 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 24.640 | - |
| Combat Systems Cert ISO Platform Cert | WR | Non-NSWCs : Various | 1.853 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.853 | - |
| C5IMP & Fleet Readiness | WR | NSWCs : PHD | 12.262 | 1.834 | Nov 2017 | 2.700 | Nov 2018 | 2.407 | Nov 2019 | - | | 2.407 | Continuing | Continuing | Continuing |
| C5IMP & Fleet Readiness | C/CPFF | Non-NSWCs : Various | 0.000 | 0.240 | Dec 2017 | 0.209 | Dec 2018 | 0.366 | Dec 2019 | - | | 0.366 | 0.000 | 0.815 | - |
| Warfare Systems Certification | WR | NSWCs : DD/Crane | 18.132 | 0.371 | Nov 2017 | 0.308 | Nov 2018 | 0.342 | Nov 2019 | - | | 0.342 | Continuing | Continuing | Continuing |
| Warfare Systems Certification | WR | Non-NSWCs : Various | 3.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| CNI/Design Agent | SS/CPAF | General Dynamics : Not Specified | 47.926 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 47.926 | - |
| CNI/Software Engineering | WR | NSWC : Dahlgren | 8.383 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 8.383 | - |
| CNI/Test and Evaluation | WR | CDSA : Not Specified | 3.922 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 3.922 | - |
| CNI/Systems Engineering | WR | NSWC : PHD | 2.645 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 2.645 | - |
| CNI/Miscellaneous | WR | Various : Not Specified | 7.529 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 7.529 | - |
| OA Automated Test and Retest | WR | NSWCs : Various | 17.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 17.500 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy | | | Date: March 2019 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 4 | R-1 Program Element (Number/Name)<br>PE 0603582N / *Combat System Integration* | Project (Number/Name)<br>0164 / *Combat System Integration* | |

**Product Development ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2018 Cost | FY 2018 Award Date | FY 2019 Cost | FY 2019 Award Date | FY 2020 Base Cost | FY 2020 Base Award Date | FY 2020 OCO Cost | FY 2020 OCO Award Date | FY 2020 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contract Engineering Support | C/CPFF | Gryphon Technology : VA | 35.984 | 0.991 | Jan 2018 | 4.410 | Jan 2019 | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Contract Program Management Support | C/CPFF | Delta Resources Inc. : VA | 8.141 | 0.325 | Jan 2018 | 0.000 | | 0.377 | Jan 2020 | - | | 0.377 | 0.000 | 8.843 | - |
| Travel | Allot | NAVSEA HQ : Washington, DC | 2.351 | 0.020 | Jan 2018 | 0.019 | Jan 2019 | 0.025 | Jan 2020 | - | | 0.025 | 0.000 | 2.415 | - |
| Interoperability Fixes | WR | NSWCs : Various | 1.500 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 1.500 | - |
| TIC TECHAIDS | WR | CSC : VA | 0.000 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Warfare Systems Cybersecurity | WR | NSWCs : PHD, Dahlren & Corna | 4.435 | 0.973 | Jan 2018 | 0.000 | Jan 2019 | 0.000 | | - | | 0.000 | 0.000 | 5.408 | - |
| Capabilities & Limitations | WR | NSWCs : PHD | 8.624 | 2.510 | Nov 2017 | 2.642 | Nov 2018 | 2.994 | Nov 2019 | - | | 2.994 | 0.000 | 16.770 | - |
| Cybersecurity IA | C/CPFF | CSC : VA | 0.544 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.544 | - |
| Contract Engineering Support | C/CPFF | Delta Resources Inc. : VA | 0.000 | 1.110 | Jan 2018 | 0.000 | | 3.612 | Jan 2020 | - | | 3.612 | 0.000 | 4.722 | - |
| | | **Subtotal** | 318.721 | 8.374 | | 10.288 | | 10.123 | | - | | 10.123 | Continuing | Continuing | N/A |

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

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2018 Cost | FY 2018 Award Date | FY 2019 Cost | FY 2019 Award Date | FY 2020 Base Cost | FY 2020 Base Award Date | FY 2020 OCO Cost | FY 2020 OCO Award Date | FY 2020 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Combat System Integration Testing (CSIT) | WR | NSWCs : DD/ICSTF | 5.736 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 5.736 | - |
| Interoperability Certification Assessment | WR | NSWCs : DD/ SPAWAR/San Diego | 26.804 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | Continuing | Continuing | Continuing |
| Navigation System Certification | WR | SPAWAR : Charleston, SC | 10.914 | 1.247 | Nov 2017 | 1.282 | Nov 2018 | 1.322 | Nov 2019 | - | | 1.322 | 0.000 | 14.765 | - |
| DIIAC Engineering and Operations | WR | NSWCs : DD/DN/ SPAWAR | 21.819 | 2.063 | Jan 2018 | 1.779 | Jan 2019 | 1.974 | Jan 2020 | - | | 1.974 | Continuing | Continuing | Continuing |
| DEP Engineering and Operations | WR | NSWCs : Various | 12.623 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 12.623 | - |
| Interoperability Cert Assessment | WR | NSWCs : DD/DN/ Corona | 6.183 | 2.242 | Nov 2017 | 2.058 | Nov 2018 | 2.418 | Nov 2019 | - | | 2.418 | 0.000 | 12.901 | - |

| Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy | | | Date: March 2019 |
|---|---|---|---|
| Appropriation/Budget Activity<br>1319 / 4 | R-1 Program Element (Number/Name)<br>PE 0603582N / *Combat System Integration* | Project (Number/Name)<br>0164 / *Combat System Integration* | |

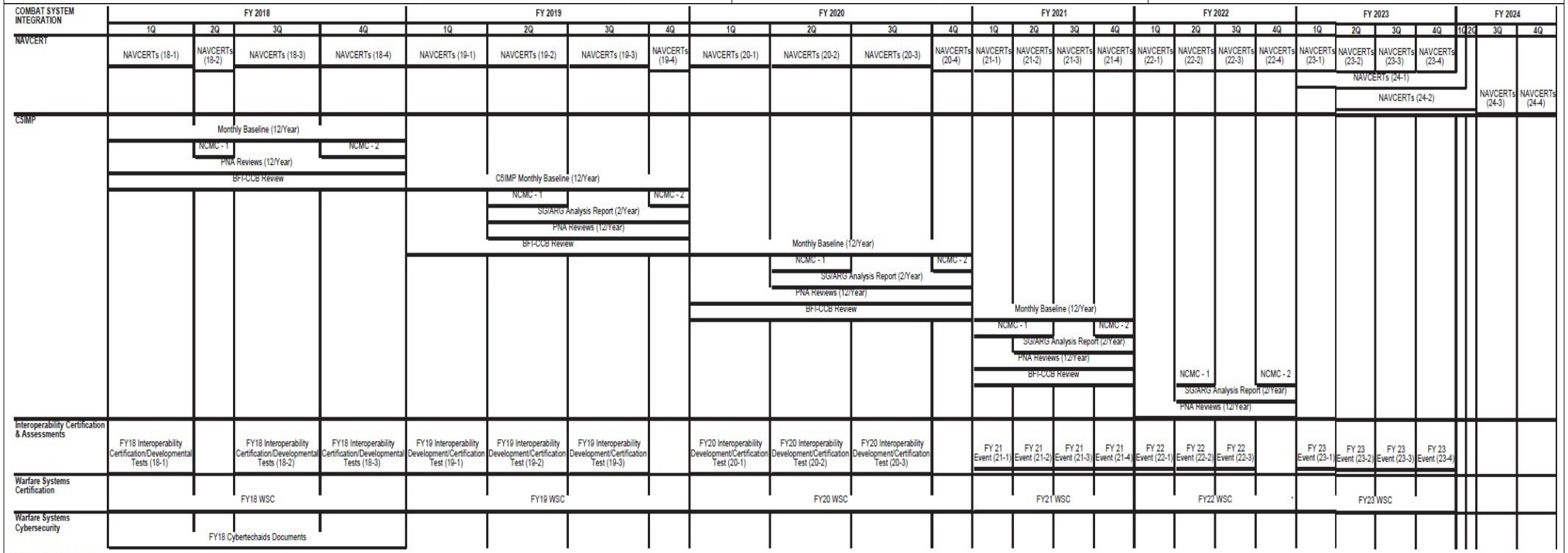
**Test and Evaluation ($ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | FY 2018 Cost | FY 2018 Award Date | FY 2019 Cost | FY 2019 Award Date | FY 2020 Base Cost | FY 2020 Base Award Date | FY 2020 OCO Cost | FY 2020 OCO Award Date | FY 2020 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interoperability Cert Assessment | C/CPFF | Non-NSWCS : CNA | 2.517 | 1.258 | Jan 2018 | 0.730 | Jan 2019 | 1.414 | Jan 2020 | - | | 1.414 | 0.000 | 5.919 | - |
| Interoperability Cert Assessment | C/CPFF | CSC : Washington, DC | 0.776 | 0.287 | Jan 2018 | 0.214 | Jan 2019 | 0.000 | | - | | 0.000 | 0.000 | 1.277 | - |
| Interoperability Cert Assessment | WR | NUWCs : Keyport | 1.268 | 0.000 | Jun 2018 | 0.000 | Jun 2019 | 0.000 | | - | | 0.000 | 0.000 | 1.268 | - |
| Interoperability Cert Assessment | WR | NSWCs : Crane/ Dahlgren | 0.771 | 0.000 | Jun 2018 | 0.000 | Jun 2019 | 0.000 | | - | | 0.000 | 0.000 | 0.771 | - |
| Interoperability Cert Assessment | C/CPFF | Various : Various | 0.652 | 0.000 | Sep 2018 | 0.000 | Sep 2019 | 0.000 | | - | | 0.000 | 0.000 | 0.652 | - |
| | | **Subtotal** | 90.063 | 7.097 | | 6.063 | | 7.128 | | - | | 7.128 | Continuing | Continuing | N/A |

| | Prior Years | FY 2018 Cost | FY 2018 Award Date | FY 2019 Cost | FY 2019 Award Date | FY 2020 Base Cost | FY 2020 Base Award Date | FY 2020 OCO Cost | FY 2020 OCO Award Date | FY 2020 Total Cost | Cost To Complete | Total Cost | Target Value of Contract |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Cost Totals** | 408.784 | 15.471 | | 16.351 | | 17.251 | | - | | 17.251 | Continuing | Continuing | N/A |

**Remarks**

| Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |



| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| ***COMBAT SYSTEM INTEGRATION*** | | | | |
| NAVCERT: FY18 NAVCERTS (CG 53, DDG 63, DDG 84, MCM 6, MCM 4) | 1 | 2018 | 1 | 2018 |
| NAVCERT: FY18 NAVCERT (DDG 75, DDG 87,DDG 101, DDG 110) | 2 | 2018 | 2 | 2018 |
| NAVCERT: FY18 NAVCERT (CG 56, DDG 55, DDG 59, DDG 82, DDG 85, DDG 87, LPD 25, LPD 26) | 3 | 2018 | 3 | 2018 |
| NAVCERT: FY18 NAVCERT (CG 59 ,CG 73, DDG 53, DDG 71, DDG 103 , LHD 4) | 4 | 2018 | 4 | 2018 |
| NAVCERT: FY19 NAVCERTs (CVN 69, CVN 71, DDG 78, DDG 90, DDG 91, LCC 19, LCS 1, LCS 3, LHA 6,LHD 5. LPD 17, LPD 18,LSD 41, LSD 45 LSD 50, MCM 10) | 1 | 2019 | 1 | 2019 |
| NAVCERT: FY19 NAVCERTs (CG 58, CG 61, CG 67, LHD 8, LPD 22, MCM 9) | 2 | 2019 | 2 | 2019 |
| NAVCERT: FY19 NAVCERTs (CVN 68, CVN 76, DDG 89, DDG, 97, DDG 104, LCS 4, LCS 14, LHD 7, LPD 19, LSD 52, MCM 7, MCM 8) | 3 | 2019 | 3 | 2019 |
| NAVCERT: FY19 NAVCERTs (DDG 51. DDG 68 ) | 4 | 2019 | 4 | 2019 |
| NAVCERT: FY20 NAVCERTs (CG 57, DDG 105, LHD 2, LHD 6, LSD 43, LSD 44) | 1 | 2020 | 1 | 2020 |
| NAVCERT: FY20 NAVCERTs (CVN 75, CVN 77, DDG 54, LCS 1, LPD 21) | 2 | 2020 | 2 | 2020 |
| NAVCERT: FY20 NAVCERTs (CG 53, CVN 70, DDG 65, DDG 107, DDG 108, LHD 1, LPD 23, LSD 47) | 3 | 2020 | 3 | 2020 |
| NAVCERT: FY20 NAVCERTs (CVN 78, DDG 111, LPD 20, LPD 24, MCM 14) | 4 | 2020 | 4 | 2020 |
| NAVCERT: FY21 NAVCERTs (CVN 72, DDG 55, LCS 2, LHD 5, LPD 17, LPD 18, MCM 11) | 1 | 2021 | 1 | 2021 |
| NAVCERT: FY21 NAVCERTs (CVN 69, DDG 95, DDG 110, LHD 4, LHD 5, LSD 49, LSD 51) | 2 | 2021 | 2 | 2021 |
| NAVCERT: FY21 NAVCERTs (CG 54, CVN 76, LHD 8, LPD 17B | 3 | 2021 | 3 | 2021 |
| NAVCERT: FY21 NAVCERTs (CVN 73, DDG 53, DDG 97, LSD 45, LSD 48) | 4 | 2021 | 4 | 2021 |
| NAVCERT: FY22 NAVCERTs (CG 72, CVN 78, LSD 50, MCM 13) | 1 | 2022 | 1 | 2022 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| NAVCERT: FY22 NAVCERTs (CG 70, LPD 18, LSD 52) | 2 | 2022 | 2 | 2022 |
| NAVCERT: FY22 NAVCERTs ( CVN 77, DDG 54, LHD 2, LHD 7, LPD 27) | 3 | 2022 | 3 | 2022 |
| NAVCERT: FY22 NAVCERT ( DDG 52, DDG 57, DDG 112, LCS 1, LSD 44, LSD 46) | 4 | 2022 | 4 | 2022 |
| NAVCERT: FY23 NAVCERT (LHD 1, LPD 21) | 1 | 2023 | 1 | 2023 |
| NAVCERT: FY23 NAVCERT (CG 60, CG 73, CVN78, DDG 55, DDG 60, DDG 90, DDG 96) | 2 | 2023 | 2 | 2023 |
| NAVCERT: FY23 NAVCERT (CVN 73, DDG 74,LHD 6, LPD 23) | 3 | 2023 | 3 | 2023 |
| NAVCERT: FY23 NAVCERT (DDG 61, LHD 3, LSD 43) | 4 | 2023 | 4 | 2023 |
| NAVCERT: FY24 NAVCERT (CVN 71 , CVN 78, DDG 78, LHA 6) | 1 | 2023 | 1 | 2024 |
| NAVCERT: FY24 NAVCERT (CG 58, CG, 61, CG67, DDG 58, DDG 81, DDG 102, MCM 9) | 2 | 2023 | 2 | 2024 |
| NAVCERT: FY24 NAVCERT (CVN 68, CVN 72, DDG 67, DDG 79, DDG 83, DDG 89. DDG 97, DDG104., DDG 116, DDG 1000. LCS 4, LCS 14,LJD 7, LSD 48, LSD 52, MCM 7, MCM 8) | 3 | 2024 | 3 | 2024 |
| NAVCERT: FY24 NAVCERT (CG 63, CG 64, DDG 51, DDG 68, DDG 76, LSD, 46) | 4 | 2024 | 4 | 2024 |
| C5IMP: FY18 C5IMP Monthly Baseline (12/Year) (84 BLs planned) | 1 | 2018 | 4 | 2018 |
| C5IMP: FY18 NCMC - 1 | 2 | 2018 | 2 | 2018 |
| C5IMP: FY18 NCMC - 2 | 4 | 2018 | 4 | 2018 |
| C5IMP: FY18 PNA Reviews (12/Year) (Supports Approx 72 ship availabilities with total 75 PNAs conducted) | 1 | 2018 | 4 | 2018 |
| C5IMP: FY18 BFI-CCB Review,comment on and process approximately 2000 proposed changes throughout the year. | 1 | 2018 | 4 | 2018 |
| C5IMP: FY19 C5IMP Monthly Baseline (12/Year) 92 BL's planned | 1 | 2019 | 4 | 2019 |
| C5IMP: FY19 NCMC - 1 | 2 | 2019 | 2 | 2019 |
| C5IMP: FY19 NCMC - 2 | 4 | 2019 | 4 | 2019 |
| C5IMP: FY19 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2019 | 4 | 2019 |
| C5IMP: FY19 PNA Reviews (12/Year) (Supports Approx 76 ship availabilities with total 82 PNAs planned) | 2 | 2019 | 4 | 2019 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| C5IMP: FY19 BFI-CCB Review,comment on and process approximately 2300 proposed changes throughout the year. | 1 | 2019 | 4 | 2019 |
| C5IMP: FY20 C5IMP Monthly Baseline (12/Year) 105 BL's planned | 1 | 2020 | 4 | 2020 |
| C5IMP: FY20 NCMC - 1 | 2 | 2020 | 2 | 2020 |
| C5IMP: FY20 NCMC - 2 | 4 | 2020 | 4 | 2020 |
| C5IMP: FY20 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2020 | 4 | 2020 |
| C5IMP: FY20 PNA Reviews (12/Year) (Supports 81 ship availabilities with 94 PNAs planned) | 1 | 2020 | 4 | 2020 |
| C5IMP: FY20 BFI-CCB Review,comment on and process approximately 2500 proposed changes throughout the year. | 1 | 2020 | 4 | 2020 |
| C5IMP: FY21 C5IMP Monthly Baseline (12/Year) 115 BL's planned | 1 | 2021 | 4 | 2021 |
| C5IMP: FY21 NCMC - 1 | 1 | 2021 | 2 | 2021 |
| C5IMP: FY21 NCMC - 2 | 4 | 2021 | 4 | 2021 |
| C5IMP: FY21 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2021 | 4 | 2021 |
| C5IMP: FY21 PNA Reviews (12/Year) (Supports 85 ship availabilities with 105 PNAs planned) | 1 | 2021 | 4 | 2021 |
| C5IMP: FY21 BFI-CCB Review,comment on and process approximately 2500 proposed changes throughout the year. | 1 | 2021 | 4 | 2021 |
| C5IMP: FY22 C5IMP Monthly Baseline (12/Year) 123 BL's planned | 1 | 2021 | 4 | 2021 |
| C5IMP: FY22 NCMC - 1 | 2 | 2022 | 2 | 2022 |
| C5IMP: FY22 NCMC - 2 | 4 | 2022 | 4 | 2022 |
| C5IMP: FY22 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2022 | 4 | 2022 |
| C5IMP: FY22 PNA Reviews (12/Year) (Supports 87 ship availabilities with 112 PNAs planned) | 1 | 2022 | 4 | 2022 |
| C5IMP: FY22 BFI-CCB Review,comment on and process approximately 2800 proposed changes throughout the year. | 1 | 2022 | 4 | 2022 |
| C5IMP: FY23 C5IMP Monthly Baseline (12/Year) 130 BL's planned | 1 | 2023 | 4 | 2023 |
| C5IMP: FY23 NCMC - 1 | 2 | 2023 | 2 | 2023 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| C5IMP: FY23 NCMC - 2 | 4 | 2023 | 4 | 2023 |
| C5IMP: FY23 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2023 | 4 | 2023 |
| C5IMP: PNA Reviews (12/Year) (Supports 90 ship availabilities with 120 PNAs planned) | 1 | 2023 | 1 | 2024 |
| C5IMP: FY23 BFI-CCB Review,comment on and process approximately 3000 proposed changes throughout the year. | 1 | 2023 | 4 | 2023 |
| C5IMP: FY24 C5IMP Monthly Baseline (12/Year) 130 BL's planned | 1 | 2024 | 4 | 2024 |
| C5IMP: FY24 PNA Reviews (12/Year) (Supports 90 ship availabilities with 120 PNAs planned) | 1 | 2024 | 4 | 2024 |
| C5IMP: FY24 NCMC - 1 | 2 | 2024 | 2 | 2024 |
| C5IMP: FY24 NCMC - 2 | 4 | 2024 | 4 | 2024 |
| C5IMP: FY24 SG/ARG Analysis Report (2/Year - Presented at NCMC) | 2 | 2024 | 4 | 2024 |
| C5IMP: FY24 BFI-CCB Review,comment on and process approximately 3000 proposed changes throughout the year. | 1 | 2024 | 4 | 2024 |
| Interoperability Certification & Assessments: FY18 IOP CERT/DEV Tests (18-1): SSDS 10.10.05, AEGIS B/L 9C2.0 (Build 24); ACS 9.A2.0A (B24); ACS 5.3.11/12; ACS 7.2.2 ; LCS Independence BL 1 | 1 | 2018 | 1 | 2018 |
| Interoperability Certification & Assessments: FY18 IOP CERT/DEV Tests (18-2): AEGIS B/L 9A2.1/9C2.1 (Build 27); SSDS 10.11.00; ACS 9.C2.0 (B24); ACS 7.2.2 | 3 | 2018 | 3 | 2018 |
| Interoperability Certification & Assessments: FY18 IOP CERT/DEV Tests (18-3): AEGIS B/L 9A2.1/9C2.1 (Build 27); SSDS 10.11.01 | 4 | 2018 | 4 | 2018 |
| Interoperability Certification & Assessments: FY19 IOP CERT/DEV Tests (19-1): ACS 7.2.3 (IFF Mode 5 only); AEGIS B/L 9A2.1/9C2.1 (Build 27); SSDS 10.11.00 | 1 | 2019 | 1 | 2019 |
| Interoperability Certification & Assessments: FY19 IOP CERT/DEV Tests (19-2): AEGIS B/L 9A2.1/9C2.1 (Build 27); AEGIS 5.4 | 2 | 2019 | 2 | 2019 |
| Interoperability Certification & Assessments: FY19 IOP CERT/DEV Tests (19-3): AEGIS B/L 9C2.2 (Build 30); AEGIS 5.4 | 3 | 2019 | 3 | 2019 |
| Interoperability Certification & Assessments: FY20 IOP CERT/DEV Tests (20-1): ACS 9.C2.2 (B30); AEGIS 5.4 | 1 | 2020 | 1 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Interoperability Certification & Assessments: FY20 IOP CERT/DEV Tests (20-2): AEGIS B/L 9C2.2 (Build 30); SSDS 10.11.02 (CVN Configuration); SSDS B/L 11.X (ACB 20); and DDG 1000 (B8.7) | 2 | 2020 | 2 | 2020 |
| Interoperability Certification & Assessments: FY20 IOP CERT/DEV Tests (20-3): AEGIS B/L 9C2.2 (Build 30); SSDS 10.11.02 (CVN Configuration); SSDS B/L 11.X; and DDG 1000 (B8.7) | 3 | 2020 | 3 | 2020 |
| Interoperability Certification & Assessments: FY21 Event (21-1) | 1 | 2021 | 1 | 2021 |
| Interoperability Certification & Assessments: FY21 Event (21-2) | 2 | 2021 | 2 | 2021 |
| Interoperability Certification & Assessments: FY21 Event (21-3) | 3 | 2021 | 3 | 2021 |
| Interoperability Certification & Assessments: FY21 Event (21-4) | 4 | 2021 | 4 | 2021 |
| Interoperability Certification & Assessments: FY22 Event (22-1) | 1 | 2022 | 1 | 2022 |
| Interoperability Certification & Assessments: FY22 Event (22-2) | 2 | 2022 | 2 | 2022 |
| Interoperability Certification & Assessments: FY22 Event (22-3) | 3 | 2022 | 3 | 2022 |
| Interoperability Certification & Assessments: FY22 Event (22-4) | 4 | 2022 | 4 | 2022 |
| Interoperability Certification & Assessments: FY22 Event (23-1) | 1 | 2023 | 1 | 2023 |
| Interoperability Certification & Assessments: FY22 Event (23-2) | 2 | 2023 | 2 | 2023 |
| Interoperability Certification & Assessments: FY22 Event (23-3) | 3 | 2023 | 3 | 2023 |
| Interoperability Certification & Assessments: FY22 Event (23-4) | 4 | 2023 | 4 | 2023 |
| Interoperability Certification & Assessments: FY24 Event (24-1) | 1 | 2024 | 1 | 2024 |
| Interoperability Certification & Assessments: FY24 Event (24-2) | 2 | 2024 | 2 | 2024 |
| Interoperability Certification & Assessments: FY24 Event (24-3) | 3 | 2024 | 3 | 2024 |
| Interoperability Certification & Assessments: FY24 Event (24-4) | 4 | 2024 | 4 | 2024 |
| Warfare Systems Certification: FY18 Warfare Systems Cert (134 Certification Events + 41 WSCPs) | 1 | 2018 | 4 | 2018 |
| Warfare Systems Certification: FY19 Warfare Systems Cert (163 Certification Events + 77 WSCPs) | 1 | 2019 | 4 | 2019 |
| Warfare Systems Certification: FY20 Warfare Systems Cert (130 Certification Events + 64 WSCPs) | 1 | 2020 | 4 | 2020 |

| Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy | | Date: March 2019 |
|---|---|---|
| **Appropriation/Budget Activity**<br>1319 / 4 | **R-1 Program Element (Number/Name)**<br>PE 0603582N / *Combat System Integration* | **Project (Number/Name)**<br>0164 / *Combat System Integration* |

| | Start | | End | |
|---|---|---|---|---|
| **Events by Sub Project** | **Quarter** | **Year** | **Quarter** | **Year** |
| Warfare Systems Certification: FY21 Warfare Systems Cert (146 Certification Events + 73 WSCPs) | 1 | 2021 | 4 | 2021 |
| Warfare Systems Certification: FY22 Warfare Systems Cert (131 Certification Events + 12 WSCPs) | 1 | 2022 | 4 | 2022 |
| Warfare Systems Certification: FY23 Warfare Systems Cert (140 Certification Events + 20 WSCPs) | 1 | 2023 | 4 | 2023 |
| Warfare Systems Certification: FY24 Warfare Systems Cert (132 Certification Events +35 WSCPs) | 1 | 2018 | 1 | 2024 |
| Warfare Systems Cybersecurity: FY18 Cybertechaids Documents (2) | 1 | 2018 | 4 | 2018 |