Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy											Date: April 2022	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 6: *RDT&E Management Support*					R-1 Program Element (Number/Name) PE 0605863N *I RDT&E Ship & Aircraft Support*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	102.713	135.149	173.352	-	173.352	194.455	144.826	143.519	163.234	Continuing	Continuing
0568: *RDT&E Acft Flt Hours*	0.000	37.176	38.461	39.471	-	39.471	38.574	39.327	40.096	40.898	Continuing	Continuing
0569: *RDT&E Acft Supt*	0.000	38.315	54.013	50.391	-	50.391	51.349	52.340	53.372	54.440	Continuing	Continuing
2924: *SDTS*	0.000	12.215	15.061	21.306	-	21.306	48.003	15.436	15.655	15.910	Continuing	Continuing
3206: *T&E Enterprise*	0.000	14.815	14.735	44.949	-	44.949	38.583	18.617	15.277	32.487	Continuing	Continuing
3238: *Threat Engineering*	0.000	0.192	12.879	17.235	-	17.235	17.946	19.106	19.119	19.499	Continuing	Continuing

A. Mission Description and Budget Item Justification

This continuing program provides support for the Self Defense Test Ship and developmental test squadron aircraft required to support Research, Development, Test and Evaluation (RDT&E) of new systems. The RDT&E ship and aircraft inventory is required to adequately test modifications and improvements to fielded weapon systems and sensors and new weapon systems and sensors and evaluate modifications to address new threat capabilities to increase the warfighting capability of the fleet. The program provides integrated logistics support for aircraft at selected field activities, provides depot-level maintenance of aircraft, engines and components for the Navy's inventory of RDT&E aircraft; and provides support for DON aircraft in the custody of contractors in support of RDT&E. The Self Defense Test Ship is a remotely operated platform that supports the test and evaluation of surface ship sensors, combat systems and weapons within the close-in self defense zone. Cost covered under this element include test execution for the Air Warfare Ship Self-Defense Enterprise, aircrew training and proficiency, fuel, supplies, equipment, repair and Aviation Depot Level Repairables, as well as organizational, intermediate and depot maintenance of aircraft in the Navy RDTE inventory and the Self Defense Test Ship. Threat engineering provides test and evaluation (T&E) modeling and simulation (M&S) products and informs targets, simulators, and stimulator designs and development. This project satisfies Surface Navy advanced missile system threat characterization and verification, validation, & accreditation (VV&A) requirements for testing

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing installations or operations required for general research, development, test and evaluation.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy					Date: April 2022
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 6: *RDT&E Management Support*			R-1 Program Element (Number/Name) PE 0605863N *I RDT&E Ship & Aircraft Support*		
B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	103.630	135.149	0.000	-	0.000
Current President's Budget	102.713	135.149	173.352	-	173.352
Total Adjustments	-0.917	0.000	173.352	-	173.352
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.917	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	173.352	-	173.352

Change Summary Explanation

Project 2924: FY2023 funding increase of $6.245M supports procurement of long lead items and associated planning efforts for an FY2024 Selected Restricted Availability that will include inspections and repair of critical hull, mechanical and electrical equipment to extend the service of life of the ex Paul F. Foster EDD 964 and support unrestricted operations at sea as an unmanned Ship Self Defense test platform.

Project 3206- Increase of funding from FY2022 to FY2023 of $30.214M is provided for the following:
$15M for lead ship testing of the CVN 78 configuration. $4.214M for Enterprise Testbed (ETB) dual-band radar (DBR) model development for use in FY24 modeling and simulation (M&S) combat system validation tests. $11M for One-time buy of combat system and weapon elements required for AW SSD testing for CVN 79, LHA 8, and LPD Flight II.

Project 3238: Acquisition Threat Engineering Product (ATEP) increase of $4.356M from FY 2022 to FY 2023 provide funds to increase ATEP model delivery. Allowing for continued Support and Sustainment (S&S) of 3 Threat Models that remain in continued use. Continue Development and Integration (D&I) of 9 Threat Models to support Developmental Testing (DT) and Operational Testing (OT) of numerous Combat Systems and Ships.

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / *RDT&E Ship & Aircraft Support*	Project (Number/Name) 0568 / *RDT&E Acft Flt Hours*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0568: *RDT&E Acft Flt Hours*	0.000	37.176	38.461	39.471	-	39.471	38.574	39.327	40.096	40.898	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Research, Development, Test and Evaluation (RDT&E) Aircraft Flight Hours. This non-acquisition project supports direct flight hour costs and a portion of the costs of Aviation Depot Level Repairables (AVDLR) associated with NAVAIR test pilot proficiency flights, including organizational and intermediate maintenance, associated consumables, including petroleum, oil, lubricants and spare and replacement parts for components that fail. Annual test pilot flight hours, as delineated in OPNAVINST 3710.7 are satisfied through a combination of program funded test flights, which vary year to year based on program schedules; and flights funded through this project unit to ensure a baseline level of pilot readiness. These flight hours ensure test pilots remain proficient in assigned type / model / series aircraft in which they are qualified (approximately 3 hours per month) during lulls in program test schedules to ensure proficient test pilots are available to safely support aviation program testing. Readiness hours are designed to provide aircrew with a minimum of 11 flight hours per month, for a total of 133 hours annually. Flight hours support post maintenance acceptance test flights, aircrew training and test pilot proficiency when test program demand is low, in direct support of Research and Development Programs at Naval Air Systems Command, and Office of Naval Research flight activities.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward maintaining test pilot readiness in direct support of general research, development, test and evaluation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: RDT&E Acft Flt Hours	37.176	38.461	39.471	0.000	39.471
Articles:	-	-	-	-	-
FY 2022 Plans: Provide organizational and intermediate-level maintenance, supply and petroleum, oil, lubricants and spare and replacement parts for components that fail in support of test pilot proficiency flights. Increase in funding, funds readiness to 60% of the requirement. Increase is based on assessment of FY22 program workload to ensure test pilots remain sufficiently proficient in order to meet OPNAVINST 3710.7 requirements to ensure flight safety and to reduce the risk of aviation mishaps.					
FY 2023 Base Plans: Provide support for direct flight hour costs, a portion of the costs of Aviation Depot Level Repairables (AVDLR) associated with NAVAIR test pilot proficiency flights, including organizational and intermediate-level maintenance, supply and petroleum, oil, lubricants and spare and replacement parts for components that fail in support of test pilot proficiency flights. Increase in funding, funds readiness to 60% of the requirement.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 6	**R-1 Program Element (Number/Name)** PE 0605863N / *RDT&E Ship & Aircraft Support*	**Project (Number/Name)** 0568 / *RDT&E Acft Flt Hours*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Increase is based on assessment of FY23 program workload to ensure test pilots remain proficient and to meet OPNAVINST 3710.7 requirements, to ensure flight safety and to reduce the risk of aviation mishaps. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Budget increase of $1.010M from FY 2022 to FY 2023 reflects increased costs associated with Consumable Parts and organizational contract maintenance in support of monthly readiness flight hour requirements for NAVAIR test pilots supporting RDT&E of Navy aviation programs.					
Accomplishments/Planned Programs Subtotals	37.176	38.461	39.471	0.000	39.471

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / *RDT&E Ship & Aircraft Support*	Project (Number/Name) 0569 / *RDT&E Acft Supt*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
0569: *RDT&E Acft Supt*	0.000	38.315	54.013	50.391	-	50.391	51.349	52.340	53.372	54.440	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Research, Development, Test and Evaluation (RDT&E) Aircraft Support. This continuing project funds costs associated with the preventive and corrective maintenance of fixed and rotary wing aircraft which directly support test and evaluation of aircraft and associated weapon systems and sensors. Testing aboard dedicated RDT&E aircraft reduces the number of fleet units required to support test and evaluation of aviation programs. This project unit funds airframe Standard Depot Level Maintenance (SDLM), the Integrated Maintenance Concept and Planned Depot Maintenance, major in-service repairs, emergent repairs and aircraft engine periodic maintenance and overhauls and aircraft material condition and field inspections. Also included in this project unit, are the costs of Aviation Depot Level Repairables (AVDLR), which are spare and replacement parts for components that fail during the conduct of readiness flight operations, aircrew training and proficiency flight hours, and must be replaced to support follow-on flight operations. This project unit also funds Aircraft Structure Periodic Assessments (ASPA), Individual Material Readiness List (IMRL) tools and support equipment, Aviation Climate Assessment Survey System (ACASS) and other projects and peripheral equipment associated with the maintenance of flight readiness for RDT&E aircraft.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under RESEARCH, DEVELOPMENT, TEST and EVALUATION MANAGEMENT SUPPORT because it supports efforts directed toward sustaining or modernizing equipment required for general research, development, test and evaluation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Aircraft/Engine Maintenance and AVDLR/IMRL Support	37.715	53.413	49.791	0.000	49.791
Articles:	-	-	-	-	-
FY 2022 Plans: Provide support of RDT&E Aircraft planned depot maintenance events while funding annual operating and sustainment costs associated with Aviation Depot Level Repairables (AVDLR) and Individual Material Readiness List (IMRL) items associated with test pilot proficiency flights, engine repairs and overhauls, and emergent repairs to RDT&E aircraft. Execute Depot events for two KC-130Ts, two P-3Cs, efforts to support an additional Planned Depot Maintenance activity for one E-2D aircraft, and Depot events for seven F-18 variant aircraft, and four MH-60 helicopters. The 2022 base plan supports operations and implementation of Naval Air Enterprise Naval Sustainment Systems in support of fleet aircraft readiness efforts.					
FY 2023 Base Plans: Provide support of RDT&E Aircraft planned depot maintenance events while funding annual operating and sustainment costs associated with Aviation Depot Level Repairables (AVDLR) and Individual Material Readiness					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 6	**R-1 Program Element (Number/Name)** PE 0605863N / *RDT&E Ship & Aircraft Support*	**Project (Number/Name)** 0569 / *RDT&E Acft Supt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
List (IMRL) items associated with test pilot proficiency flights, engine repairs and overhauls, and emergent repairs to RDT&E aircraft. The 2023 base plan supports operations and implementation of Naval Air Enterprise Naval Sustainment Systems in support of fleet aircraft readiness efforts. Major Depot events include one KC-130T, one P-8A, efforts to support an additional Planned Depot Maintenance activity for one E-2D aircraft, and Depot events for eight F-18 variant aircraft, two T-45Cs, one TH-57C, two UH-1Ys and four MH-60 helicopters. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Budget decrease of $3.622M from FY 2022 to FY 2023 reflects a reduced maintenance requirement which varies year to year based on phasing of periodic depot maintenance requirements, which vary by type, model and series for airframes assigned to the RDTE inventory.					
Title: In-Service Repairs	0.600	0.600	0.600	0.000	0.600
Articles:	-	-	-	-	-
FY 2022 Plans: Provide planned In-Service Repair funds for emergent repair requirements to aircraft performing mission critical test and evaluation projects. ***FY 2023 Base Plans:*** Provide planned In-Service Repair funds for emergent repair requirements to aircraft performing mission critical test and evaluation projects. ***FY 2023 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	38.315	54.013	50.391	0.000	50.391

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / *RDT&E Ship & Aircraft Support*	Project (Number/Name) 2924 / *SDTS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
2924: *SDTS*	0.000	12.215	15.061	21.306	-	21.306	48.003	15.436	15.655	15.910	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the preventive and corrective maintenance of mission critical Hull Mechanical and Electrical (HM&E) and remote control system maintenance aboard the Self-Defense Test Ship (SDTS) in support of the Navy RDT&E of ship self-defense systems. Testing aboard this ship provides the capability to safely test self-defense weapon systems within their minimum range and reduces the number of fleet units required to support RDT&E efforts.

Funds are used to purchase consumable supplies and repair parts, conduct routine preventive and emergent corrective maintenance and engineering support services.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: SDTS	12.215	15.061	21.306	0.000	21.306
Articles:	-	-	-	-	-
FY 2022 Plans: NSWC PHD continues to conduct management, operation, maintenance and repair/upgrade of critical ship HM&E systems to ensure safe operation of the Self Defense Test Ship (SDTS). Maintain, operate, configure and upgrade the Test Ship Remote Control System (TSCRS) and associated infrastructure in support of T&E requirements onboard the SDTS to support the Air Warfare Ship Self Defense Enterprise test requirements as well as surface ship combat system developmental test programs. Incorporate additional maintenance and repair efforts stemming from the 2017 Board of Inspection and Survey Report and complete necessary repairs to clear any outstanding Departures from Specification (DFS).					
FY 2023 Base Plans: NSWC PHD continues to conduct management, operation, maintenance and repair/upgrade of critical ship HM&E systems to ensure safe operation of the Self Defense Test Ship (SDTS). Maintain, operate, configure and upgrade the Test Ship Remote Control System (TSCRS) and associated infrastructure in support of T&E requirements onboard the SDTS to support the Air Warfare Ship Self Defense Enterprise test requirements as well as surface ship combat system developmental test programs. Continue to work outstanding maintenance and repair efforts and complete necessary repairs to clear any outstanding Departures from Specification (DFS).					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 6	**R-1 Program Element (Number/Name)** PE 0605863N / *RDT&E Ship & Aircraft Support*	**Project (Number/Name)** 2924 / *SDTS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Support planning and procurement of long lead items and upgrade of the Test Ship Remote Control System for the SDTS Selected Restricted Availability in FY24. Without depot level maintenance, the SDTS will be unsafe for at sea operations past FY25. SRA will extend the life of the SDTS through FY29 to support execution of the CVN 79, LPD Flight II and LHA 8 test programs. SRA will afford repair/replacement of critical HM&E Systems such as safety systems, electrical systems, main engine, fuel oil storage and service systems, firemain and seawater support systems. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** An increase of $6.245M from FY22 to FY23 is for support planning and procurement of long lead items in support of FY 24 Selected Restricted Availability (SRA) for the Self Defense Test Ship EDD 964. Without depot level maintenance, the SDTS will be unsafe for at sea operations past FY25. SRA will extend the life of the SDTS through FY29. SRA will afford repair/replacement of critical HM&E Systems such as safety systems, electrical systems, main engine, fuel oil storage and service systems, firemain and seawater support systems. $6.245M is required in FY23 to support planning and procurement of long lead items and upgrade of the Test Ship Remote Control System for the SDTS Selected Restricted Availability in FY24 ($32.0M).					
Accomplishments/Planned Programs Subtotals	12.215	15.061	21.306	0.000	21.306

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This line of accounting is for recurring HM&E and ship maintenance.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / *RDT&E Ship & Aircraft Support*	Project (Number/Name) 3206 / *T&E Enterprise*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3206: *T&E Enterprise*	0.000	14.815	14.735	44.949	-	44.949	38.583	18.617	15.277	32.487	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The current T&E Enterprise strategy consolidates all Air Warfare Ship Self Defense (AW SSD) testing across multiple class ships (LHA 6, CVN 78, DDG 1000, LSD 52, and LCS) into the least number of test events. The follow-on T&E strategy consolidates AW SSD testing for the Ship Self Defense System (SSDS) Integrated Combat System (ICS) Build 12. This will include the required Operational Testing (OT) in support of CVN 79, LHA 8, and LPD Flt II Ship classes. This approach merges common ship, element, and system requirements into common infrastructure for combined Developmental and Operational Testing (DT/OT) of the Surface Navy antiship cruise missile (ASCM) defense requirement, expressed as a Probability of Raid Annihilation (Pra). Enterprise characterizes system performance with Modeling & Simulation (M&S) assessments and live-fire demonstrations.

Enterprise Cost elements:
a) Enterprise Testing and Planning. SDTS and Lead Ship tracking and firing exercises versus single- and dual-, subsonic and supersonic ASCM threat surrogates. Includes the contractor and government costs to administer the Enterprise, collect and distribute data from live events, maintain Cybersecurity certifications, and financial management.
b) Self-Defense Test Ship (SDTS) Combat Systems. Includes installation, check-out, stage testing, routine preventive maintenance, and repairs of major combat systems elements.
c) Enterprise Testbed (ETB). Includes all M&S costs required to create OT-quality digital representations of shipboard combat system performance including infrastructure, distributed secure network, and common environmental services for DT/OT.

SDTS testing requirements outlined in AW SSD Enterprise TEMP 1714 and lead/operational ship testing requirements for Evolved Sea Sparrow Missile (ESSM) TEMP 1471, Rolling Airframe Missile (RAM) Blk 2 TEMP 286-2, DDG 1000 TEMP 1560, CVN 78 TEMP 1610, Cooperative Engagement Capability (CEC) TEMP 1415, SSDS TEMP 1400, LHA 6 TEMP 1697, AN/SPQ-9B TEMP 1463, Surface Electronic Warfare Improvement Program (SEWIP) TEMP 1658 (Block 1A), and LCS TEMP 1695.

The T&E Enterprise merges common ship, element, and system requirements into the least number of test events while leveraging planned Combat System Ship Qualification Trials (CSSQTs) to accomplish Developmental Testing (DT) and Operational Testing (OT) requirements. All tests on the SDTS require the sharing of infrastructure, missile range allocations, execution time and underway time to eliminate duplicative testing. T&E Enterprise provides end-to-end mission Operational Testing in a realistic operational environment, capitalizing on Probability of Raid Annihilation Modeling and Simulation (M&S) data validated with results of that Operational and Live Fire Testing, and ensuring a consistent approach across ship classes. Applicability of all test events is beneficial across multiple ship classes with the same variation under test.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 6	**R-1 Program Element (Number/Name)** PE 0605863N / *RDT&E Ship & Aircraft Support*	**Project (Number/Name)** 3206 / *T&E Enterprise*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: T&E Enterprise	14.815	14.735	44.949	0.000	44.949
Articles:	-	-	-	-	-
FY 2022 Plans: Continue to conduct test planning which includes white cell planning meetings, TEMP working group meetings, and other meetings that support at-sea and Enterprise Testbed (ETB) events for CVN 78, in order to be postured to execute events if funding is made available. Continue test planning efforts for the follow-on ship classes (e.g. CVN 79, LHA 8, LPD FLT II) and assist the pertinent stakeholders in developing test planning documentation and resourcing requirements. Develop acquisition plans for required equipment onboard SDTS to meet test requirements for follow-on ship classes. Continue ETB virtual range development, and documentation of the ETB and coordination of a multi-organizational team to perform overarching enterprise systems engineering applicable to all ETB baselines. Continue routine combat systems maintenance and IA/Cybersecurity Certification and Accreditation on combat systems elements and the remote control system on the SDTS. If repair parts are required to support T&E event(s), impacted T&E User may be required to fund replacement parts. Continue to facilitate the integration of systems into the PEO IWS M&S shared technical framework to allow the most efficient utilization of the Enterprise Test Bed (ETB).					
FY 2023 Base Plans: Lead ship testing of the CVN 78 configuration. Enterprise Testbed (ETB) dual-band radar (DBR) model development for use in FY24 modeling and simulation (M&S) combat system validation tests. One-time buy of combat system and weapon elements required for AW SSD testing for CVN 79, LHA 8, and LPD Flight II. Aligns with project code 2924 (SDTS) investment for FY24 Selected Restricted Availability (SRA) for the Self Defense Test Ship EDD 964. Depot level maintenance in FY24 supports operations at sea for CVN 79, LHA 8, and LPD Flight II testing beginning in FY25. Includes GPNTS system and AN/SPY-6(V) EASR support in FY 23. Assumes AN/SPY-6(V) EASR will be borrowed. Continue test planning efforts for the follow-on ship classes (e.g. CVN 79, LHA 8, LPD FLT II) and assist the pertinent stakeholders in developing test planning documentation and resourcing requirements. Develop acquisition plans for required equipment onboard SDTS to meet test requirements for follow-on ship classes. Continue ETB virtual range development, and documentation of the ETB and coordination of a multi-organizational team to perform overarching enterprise systems engineering applicable to all ETB baselines.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 6	**R-1 Program Element (Number/Name)** PE 0605863N / *RDT&E Ship & Aircraft Support*	**Project (Number/Name)** 3206 / *T&E Enterprise*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Continue routine combat systems maintenance and IA/Cybersecurity Certification and Accreditation on combat systems elements and the remote control system on the SDTS. If repair parts are required to support T&E event(s), impacted T&E User may be required to fund replacement parts. Continue to facilitate the integration of systems into the PEO IWS M&S shared technical framework to allow the most efficient utilization of the Enterprise Test Bed (ETB). ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase of $30.214M ($14.735 in FY 22 to $44.949M in FY 23) - $15M for lead ship testing of the CVN 78 configuration. CVN 78 leverage of DDG 1000 DT/OT minimized due to removal of Volume Surveillance Radar (VSR) component from DBR, resulting in additional CVN 78 lead ship test requirements, six additional ESSM missiles, and specific emitter pods - $4.214M for Enterprise Testbed (ETB) dual-band radar (DBR) model development for use in FY24 modeling and simulation (M&S) combat system validation tests. DBR modeling efforts began FY13 but delayed due to ship test delay, resulting in lack of validation data necessary to complete the model. FY17+ funding shortfalls defunded modeling efforts. - $11M for One-time buy of combat system and weapon elements required for AW SSD testing for CVN 79, LHA 8, and LPD Flight II. Includes GPNTS system and AN/SPY-6(V) EASR support in FY 23. Assumes AN/SPY-6(V) EASR will be borrowed.					
Accomplishments/Planned Programs Subtotals	14.815	14.735	44.949	0.000	44.949

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy			Date: April 2022
Appropriation/Budget Activity 1319 / 6	R-1 Program Element (Number/Name) PE 0605863N / *RDT&E Ship & Aircraft Support*	Project (Number/Name) 3238 / *Threat Engineering*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3238: *Threat Engineering*	0.000	0.192	12.879	17.235	-	17.235	17.946	19.106	19.119	19.499	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Threat Engineering program assesses the current and future threat environment, and works in coordination with the Office of Naval Intelligence (ONI) to develop, produce, and evolve digital threat engineering models in support of test and evaluation (T&E) requirements. NAVSEA requires comprehensive, validated threat modeling and simulation (M&S) products to dynamically and responsively interact with surface ship air defense systems and subsystems to allow for a performance evaluation in an operationally realistic environment. These threat M&S products, called Acquisition Threat Engineering Products (ATEP), must contain the details, features, and components necessary to react with the Blue air defense systems as the actual threats will with, deployed air defense systems to provide a comprehensive, high-confidence evaluation of Blue system capabilities. The successful and rigorous end-to-end evaluation of surface ship combat systems, to include the component systems, are required before capability and ship baselines can be delivered to the warfighter.

ATEPs are valid T&E assets that satisfy Director of Operational Test and Evaluation (DOT&E) and Commander Operational Test & Evaluation Force (COMOPTEVFOR) requirements in both Modeling and Simulation (M&S) testbed and at-sea configurations. ATEPs satisfy COMOPTEVFOR's threat model requirement for fidelity commensurate with the blue-force system representations and contain intel-derived lethality/vulnerability data, physics-based six degrees-of-freedom models, reactive seekers and guidance, and other engineering data. ATEPs are necessary to evaluate mandatory ship Key Performance Parameters (KPP), including operational effectiveness and suitability. ATEPs are also used to evaluate a system's lethality and survivability, and its ability to achieve its performance requirements within operation and sustainment costs. In many cases, ATEP models are the only way in which the Navy can accurately emulate threat ASCM performance. ATEPs reduce Navy operational testing (OT) costs by enabling portions of OT to be conducted via M&S, increasing requirements coverage and avoiding the costs of targets and weapons that would ordinarily be required to conduct OT solely via live fire events.

Threat Engineering products inform investment strategies, validate the effectiveness of capabilities provided to the Fleet, and augment live-fire T&E to obtain affordable, statistical confidence in measured performance. Threat Engineering work is prioritized to avoid technical surprise, avoid point solutions, and ensure Fleet capability against specific threats (most stressing, unique, or widely deployed and exported).

Each threat system poses unique challenges to the various combat system elements and each threat system affects Blue system effectiveness in different ways, therefore each combat system configuration must undergo rigorous testing against multiple threats. T&E using M&S is essential to fill gaps and to offer realistic operational scenarios that cannot be tested via live-fire events (due to safety, numbers of targets, limitations on the characteristics of the targets, cost to develop a realistic threat, etc.). COMOPTEVFOR has listed a number of threat representations in ATEPs as their number one and number two priorities for the past five years because they are appropriately built to represent the salient features of the threat as an Intelligence Community-Validated and sufficient product qualified to be used in Operational T&E (OT&E).

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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As each threat system is unique, the ATEP representation of each must include the features of specific threats, such as electronic countermeasures (ECM), active countermeasures, communications links, electronic counter-countermeasures (ECCM). Furthermore, the ATEP products must capture any engineering or manufacturing uncertainties as well as intelligence uncertainties so that our Blue Systems, once deployed to the Fleet, operate in the face of these threats as they were/are designed. Finally, these ATEP products must integrate with the PEO IWS testbeds to be used in Developmental and Operational T&E. In short, each validated threat product must contain the features, components, and details necessary to evaluate the specific combat system or ship baseline.

The Threat Engineering group develops specific requirements from threat foundational information (i.e., intelligence data), and systems under test. The requirements are used to guide design, development, and integration of each ATEP product. Blue Systems face severe limitations to test, and risk delayed deployment to the warfighter without required ATEP products. ATEP products need to be developed and integrated IAW Blue System needs and schedules in order to clearly evaluate performance and enable all capabilities to be delivered to the Fleet expeditiously. Additionally, until analysis is performed using the ATEP products, it is often unclear or unknown what the impacts are due to various features and techniques found to be on threat systems. The focus is to meet combat/weapon system Systems Engineering and T&E requirements for in-service and new construction surface platforms to include:
-DDG 51 FLT III
-CVN 78
-CVN 79
-LHD 8
-LPD FLT II
-FFG 62 and others

ATEPs cost approximately $5-30M per product, require a minimum of 18 months to build, and include all features and capabilities, unlimited number of runs, and may be used for live, virtual, constructive (LVC) testing. Notably, the advanced seeker discrimination, target selection, and salvo operations and decisions are difficult to characterize until the second or third versions of the ATEP products as we generally need a flying simulation before we can address and incorporate the advanced avionics features that are essential for EW testing and analysis.

It is important to note that the development and integration of each ATEP is a function of the threat system and its complexities, the available foundational intelligence data, and the Blue Systems requirements to include the schedules for T&E; therefore, the cost to develop and integrate each ATEP is not consistent. Moreover, the threat products must be sustained; there are many reasons that ATEP products require additional development and enhancements to evolve to the next version.
-Our adversaries are continually developing new threats and upgrading and improving existing threat systems additionally our understanding of the threat foundation data may change and evolve.
-Our Blue Systems and their operational characteristics change (e.g., a new Radar may operate in a new RF Band, with different channels/bandwidth, and/or other signature requirements).
-Our operating T&E or operational environments may change.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Threat Engineering	0.192	12.879	17.235	0.000	17.235
Articles:	-	-	-	-	-
FY 2022 Plans: Sustainment: -Continue Support and Sustainment (S&S) of 3 Threat Models that remain in continued use. Periodic refinement and update of models are required due to continued evolving threats. Development and Integration: -Continue to provide support for the integration and use of threat products (ATEP) in various combat system testbeds for use in Developmental and Operational Testing (DT/OT). Supported ship classes include:(but not limited to)CVN 78, DDG FLT IIA/III, and preparation for SSDS Build 12 Ships (CVN 79, LPD FLT II, LHA 8). -Continue Development and Integration of 7 Threat Models to support DT and OT events. -Continue integrating new and updated threat products (ATEPs) into M&S Testbeds to support DT and OT. Supported ship classes include but are not limited to: CVN 78, DDG FLT IIA/III, and preparation for SSDS Build 12 Ships (CVN 79, LPD FLT II, LHA 8). -DDG 51 FLT III:Continue developing 5 threat products (ATEPs) and updating 2 existing threat products (ATEPs). Required completion before Q2FY23. -CVN 78:Continue developing 5 threat products (ATEPs) and updating 2 existing threat products (ATEPs). -FFG 62:Begin developing 6 threat products (ATEPs) and update 2 existing threat products (ATEPs). T&E Support: -Provide required threat product (ATEP) support for AEGIS Baseline 9 (ACB-16) element testing (e.g., combat systems, sensors, weapons, etc.).					
FY 2023 Base Plans: Sustainment: -Continue Support and Sustainment (S&S) of 4 Threat Models that remain in continued use. Periodic refinement and update of models are required due to continued evolving threats. Development and Integration: -Continue to provide support for the integration and use of threat products (ATEP) in various combat system testbeds for use in Developmental and Operational Testing (DT/OT). Supported ship classes include: (but not limited to) CVN 78, DDG FLT IIA/III, and preparation for SSDS Build 12 Ships (CVN 79, LPD FLT II, LHA 8).					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
-Continue Development and Integration of 9 Threat Models to support DT and OT events. -Continue integrating new and updated threat products (ATEPs) into M&S Testbeds to support DT and OT. Supported ship classes include but are not limited to: CVN 78, DDG FLT IIA/III, and preparation for SSDS Build 12 Ships (CVN 79, LPD FLT II, LHA 8). -DDG 51 FLT III: Continue developing 5 threat products (ATEPs) and updating 2 existing threat products (ATEPs). Required completion before Q2FY23. -CVN 78: Continue developing 5 threat products (ATEPs) and updating 2 existing threat products (ATEPs). -FFG 62: Continue developing 6 threat products (ATEPs) and update 2 existing threat products (ATEPs). T&E Support: -Provide required support for CVN 78 M&S Testbed DT. -Provide required support for AEGIS Baseline 9.2 M&S Testbed OT. -Provide required support for AEGIS Baseline 10.0 and SLQ-32 V (7) (SEWIP Blk 3) M&S Testbed DT. -Provide continued support and preparation for SSDS Build 12 Ships (CVN 79, LPD FLT II, LHA 8). ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** An increase of $4.356M from FY22 to FY23 provides the necessary allocation for the threat model development team to: -Provide required support for AEGIS Baseline 9.2 M&S Testbed OT. -Provide required support for AEGIS Baseline 10.0 and SLQ-32 V (7) (SEWIP Blk 3) M&S Testbed DT in FY23. This is in preparation for M&S Testbed OT in FY24 in order to meet the DDG 51 FLT III Initial Operating Capability (IOC) requirements in FY24. -Continue Support and Sustainment (S&S) of 3 Threat Models that remain in continued use and require periodic updating due to continued evolving threats. -Continue Development and Integration (D&I) of 9 Threat Models to support near-term DDG 51 FLT III and CVN 78 DT and OT events and FFG 62 DT and OT events near the end of the FYDP.					
Accomplishments/Planned Programs Subtotals	0.192	12.879	17.235	0.000	17.235

C. Other Program Funding Summary ($ in Millions)

N/A

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C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

This program is in direct support to an Enterprise Test & Evaluation strategy that includes live fire test events ISO Modeling & Simulation efforts for both Developmental and Operational Testing.