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

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759N / <i>Major T&E Investment</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	0.000	138.094	74.221	65.672	-	65.672	79.535	124.335	120.434	133.569	Continuing	Continuing
2195: <i>T & E Investment</i>	0.000	101.411	74.221	65.672	-	65.672	79.535	124.335	120.434	133.569	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	36.683	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.683

A. Mission Description and Budget Item Justification

This project corrects major deficiencies, improves Test & Evaluation (T&E) capabilities, and increases T&E support effectiveness at Navy Major Range and Test Facility Base ranges and facilities. The T&E Investment project improves, modernizes and adds new test capabilities at the following test facilities: the Naval Undersea Warfare Center Division Newport Atlantic Undersea Test and Evaluation Center, Andros Island, Bahamas; the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA; the Sea Range, Land Ranges, Target Operations, Ordnance T&E Facility, Test Wing Pacific located at the Naval Air Warfare Center Weapons Division, Point Mugu, CA and China Lake, CA; and the Atlantic Test Range, Air Combat Environment T&E Facility, Electromagnetic Environmental Effects, Air Vehicle Modification and Instrumentation facility, Test Wing Atlantic, Target Operations, and the Propulsion Systems Evaluation Facility located at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD and the test and evaluation capabilities located at the Pacific Missile Range Facility, Kauai, HI.

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.

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	141.371	74.221	78.283	-	78.283
Current President's Budget	138.094	74.221	65.672	-	65.672
Total Adjustments	-3.277	0.000	-12.611	-	-12.611
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.100	0.000			
• SBIR/STTR Transfer	-2.177	0.000			
• Program Adjustments	0.000	0.000	-12.720	-	-12.720
• Rate/Misc Adjustments	0.000	0.000	0.109	-	0.109

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

FY 2023	FY 2024

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Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Congressional Add: <i>Joint simulation environment</i>	7.723	0.000
Congressional Add: <i>Real time pulse level modeling and simulation</i>	9.653	0.000
Congressional Add: <i>Test capabilities accel. - PMRF data management modernization</i>	19.307	0.000
Congressional Add Subtotals for Project: 9999	36.683	0.000
Congressional Add Totals for all Projects	36.683	0.000

Change Summary Explanation

Funding: FY 2025 funding request was reduced by \$12.611 million to fund other priority programs within the department.
 Schedule: Not applicable.
 Technical: Not applicable

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 6					R-1 Program Element (Number/Name) PE 0604759N / Major T&E Investment				Project (Number/Name) 2195 / T & E Investment			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
2195: T & E Investment	0.000	101.411	74.221	65.672	-	65.672	79.535	124.335	120.434	133.569	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project corrects major deficiencies, improves Test & Evaluation (T&E) capabilities, and increases T&E support effectiveness at Navy Major Range and Test Facility Base ranges and facilities. The T&E Investment project improves, modernizes and adds new test capabilities at the following test facilities: the Naval Undersea Warfare Center Division Newport Atlantic Undersea Test and Evaluation Center (AUTEC), Andros Island, Bahamas; the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA; the Sea Range, Land Ranges, Target Operations, Ordnance T&E Facility, Test Wing Pacific located at the Naval Air Warfare Center Weapons Division, Point Mugu, CA and China Lake, CA; and the Atlantic Test Range, Air Combat Environment T&E Facility, Electromagnetic Environmental Effects, Air Vehicle Modification and Instrumentation facility, Test Wing Atlantic, Target Operations, and the Propulsion Systems Evaluation Facility located at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD and the test and evaluation capabilities located at the Pacific Missile Range Facility, Kauai, HI.

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

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: UNDERSEA RANGE INVESTMENTS	28.389	18.905	14.565	0.000	14.565
Articles:	-	-	-	-	-
Description: This effort funds the modernization, upgrades, and new test and evaluation capabilities required at the Navy's Major Range Test Facility Base undersea ranges, to include AUTEC, Andros Island, Bahamas and the Nanoose and Dabob ranges of the Naval Undersea Warfare Center Division Keyport, Keyport, WA.					
FY 2024 Plans:					
- Complete replacement of universal winch fiber optic at Nanoose and Dabob.					
- Complete real time tracking software upgrade at Nanoose and Dabob.					
- Continue the minor upgrade and modernization of test capabilities at AUTEC, Nanoose and Dabob.					
- Continue replacement of underwater cables to hydrophone arrays at Nanoose and Dabob.					
- Continue replacement of the array structures at Nanoose and Dabob.					
- Continue replacement of the hydrophone tracking system at AUTEC.					
- Continue replacement of the tracking display system at AUTEC.					
- Initiate and complete modernization of radio communication system at AUTEC.					
- Initiate upgrade of T&E target emulator at Nanoose and Dabob.					
- Initiate upgrade of range operational security sensors at Nanoose and Dabob.					
FY 2025 Base Plans:					

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

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<ul style="list-style-type: none"> - Complete replacement of the array structures at Nanoose and Dabob. - Complete replacement of the tracking display system at AUTECH. - Continue the minor upgrade and modernization of test capabilities at AUTECH, Nanoose and Dabob. - Continue replacement of underwater cables to hydrophone arrays at Nanoose and Dabob. - Continue replacement of the hydrophone tracking system at AUTECH. - Continue upgrade of T&E target emulator at Nanoose and Dabob. - Continue upgrade of range operational security sensors at Nanoose and Dabob. -Initiate upgrade of electronic warfare signal generator at AUTECH. -Initiate site 2 power plant and lightning protection upgrade at AUTECH. -Initiate upgrade of range operational security and sensors at AUTECH. -Initiate remotely operated vehicle upgrade at Nanoose and Dabob. -Initiate range data management software at Nanoose and Dabob. -Initiate upgrade to the acoustic acquisition system at Nanoose and Dabob. <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decrease from FY 2024 to FY 2025 due to the completion of multiple projects including the universal winch fiber optic and time tracking software upgrade at Nanoose and Dabob.</p>					
<p>Title: OPEN AIR RANGE INVESTMENTS</p> <p align="right">Articles:</p> <p>Description: This effort funds the modernization and upgrades of existing capabilities and the development of new T&E capabilities required at the Navy's Major Range Test Facility Base open air ranges at the Naval Air Warfare Center Aircraft Division (NAWCAD), Patuxent River, MD, Naval Air Warfare Center Weapons Division (NAWCWD), Point Mugu, CA and China Lake, CA and Pacific Missile Range Facility (PMRF), Kauai, HI.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete procurement of Range Support Aircraft. - Complete optical tracking mount replacement at PMRF. - Complete mobile radio replacement at NAWCWD. - Continue the minor upgrade and modernization of test capabilities at NAWCAD, NAWCWD and PMRF. - Continue the development and integration of Telemetry equipment on the Range Support Aircraft. - Continue software modifications to increase air warfare battleshaping capabilities at NAWCWD. 	48.325	40.276	43.947	0.000	43.947
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<ul style="list-style-type: none"> - Continue upgrades to telemetry collection and processing capabilities at NAWCWD. - Continue upgrades to telemetry collection and processing capabilities at PMRF. - Initiate and complete purchase of network based telemetry instrumentation at NAWCAD. - Initiate and complete purchase of networked flight test instrumentation at NAWCAD. - Initiate and complete modernization of telemetry data recorders at NAWCAD. - Initiate communication system upgrade on Mobile At Sea Sensor at PMRF. - Initiate replacement of flight termination system at China Lake. - Initiate imaging radar transmitter replacement at PMRF. - Initiate cross-domain solution upgrade at NAWCAD. - Initiate upgrade of the R2508 microwave radar relay system at NAWCWD. <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Complete software modifications to increase air warfare battleshaping capabilities at NAWCWD. - Complete replacement of flight termination system at China Lake. - Complete cross-domain solution upgrade at NAWCAD. - Complete upgrade of the R2508 microwave radar relay system at NAWCWD. - Continue the minor upgrade and modernization of test capabilities at NAWCAD, NAWCWD and PMRF. - Continue the development and integration of Telemetry equipment on the Range Support Aircraft. - Continue upgrades to telemetry collection and processing capabilities at NAWCWD. - Continue upgrades to telemetry collection and processing capabilities at PMRF. - Continue communication system upgrade on Mobile At Sea Sensor at PMRF. - Continue imaging radar transmitter replacement at PMRF. -Initiate network upgrade on Mobile At Sea Sensor at PMRF. -Initiate upgrade of telemetry data routing at PMRF. -Initiate modernization of five radar systems at NAWCWD. -Initiate replacement of UHF and VHF radios at NAWCWD. -Initiate and complete purchase of a long range surveillance radar at NAWCWD. -Initiate modernization of multi-target instrumentation radar at NAWCAD. -Initiate replacement of prime movers at NAWCWD. -Initiate replacement of low speed time space position trackers at NAWCWD. -Initiate modernization of fiber infrastructure at NAWCWD. <p>FY 2025 OCO Plans:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A					
<i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> Funding increase from FY 2024 to FY 2025 due to the initiation of multiple projects including mobile at sea sensor network upgrade and telemetry data routing at PMRF, radar modernization, UHF and VHF radio replacement, long range radar purchase and prime mover replacement at NAWCWD, and multi-target instrumentation radar modernization at NAWCAD.					
<i>Title:</i> TEST FACILITIES INVESTMENTS	24.697	15.040	7.160	0.000	7.160
<i>Articles:</i>	-	-	-	-	-
<i>Description:</i> This effort funds the modernization and upgrades of existing capabilities and the development of new Test & Evaluation capabilities required at the Navy's Major Range Test Facility Base ground test facilities at NAWCAD, Patuxent River, MD, and NAWCWD, Point Mugu, CA and China Lake, CA.					
<i>FY 2024 Plans:</i>					
- Complete modernization of environmental test chambers at NAWCWD.					
- Complete development of direct drive electromagnetic pulse test capability at NAWCAD.					
- Complete development of an integrated fire control test environment at NAWCAD.					
- Continue the minor upgrade and modernization of test capabilities at NAWCAD and NAWCWD and the upgrade to general instrumentation and equipment.					
- Continue the modernization of the insensitive munitions test arena at NAWCWD. Tasks include renovating and modernizing the control room, refurbishing the test pads and cable paths to the test arena and replacing associated cabling between the test pad and control room at the Ordnance test facility.					
- Continue the modernization of the ordnance test arena at NAWCWD by replacing conduits, cabling, firing control system and data collection system.					
- Continue helicopter drive system upgrade by aligning test stand and replacing loading and instrumentation at NAWCAD.					
- Continue modernization of the electromagnetic radiation test area at NAWCAD.					
- Initiate and complete upgrade of the high horse power drive load system at NAWCAD.					
- Initiate and complete upgrade of the electromagnetic interference drive stand at NAWCAD.					
- Initiate and complete replacement of the electromagnetic pulse suspension towers at NAWCAD.					
Modeling and Simulation:					
- Complete update of Naval modeling and simulation environment to implement improved electronic warfare modeling effects, propagation and interactions. Improve fidelity and accuracy of the Electronic Warfare (EW)					

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

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>interactions and environmental effects (including Radio Frequency, Electro-Optical and Infrared (RF/EO/IR). Testing will include virtual and hardware-in-the-loop facilities and ranges to create coherent Live, Virtual, and Constructive (LVC) EW evaluation environments.</p> <ul style="list-style-type: none"> - Complete to develop architecture to integrate emerging threat intelligence products for both classified software, virtual and low-cost hardware representations. Task will improve and integrate Integrated Threat Analysis Simulation Environment (ITASE) to meet Navy requirements. Task will integrate classified mixed hardware / software threat emulations into a realtime LVC environment. Threat will be available through innovative repository/cloud solutions. <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Complete the modernization of the insensitive munitions test arena at NAWCWD. Tasks include renovating and modernizing the control room, refurbishing the test pads and cable paths to the test arena and replacing associated cabling between the test pad and control room at the Ordnance test facility. - Complete the modernization of the ordnance test arena at NAWCWD by replacing conduits, cabling, firing control system and data collection system. - Complete helicopter drive system upgrade by aligning test stand and replacing loading and instrumentation at NAWCAD. - Complete modernization of the electromagnetic radiation test area at NAWCAD. - Continue the minor upgrade and modernization of test capabilities at NAWCAD and NAWCWD and the upgrade to general instrumentation and equipment. -Initiate and complete replacement of electromagnetic pulse peaker removal fixture at NAWCAD. -Initiate and complete upgrade of the magic wall payload system at NAWCAD. <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: Funding decrease from FY 2024 to FY 2025 due to the completion of the remaining modeling and simulation tasks along with the environmental test chambers at NAWCWD and development of the direct drive electromagnetic pulse test capability and the integrated fire control test environment at NAWCAD.</p>					
Accomplishments/Planned Programs Subtotals	101.411	74.221	65.672	0.000	65.672

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

N/A

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

Remarks

D. Acquisition Strategy

Not Applicable.

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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	36.683	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	36.683
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2023	FY 2024
<i>Congressional Add:</i> Joint simulation environment	7.723	0.000
<i>FY 2023 Accomplishments:</i> Initiate and complete improvements to red air threat realism, develop a cyber warfare effects environment and develop a large force cross domain scenario in the Joint Simulation Environment.		
<i>FY 2024 Plans:</i> N/A		
<i>Congressional Add:</i> Real time pulse level modeling and simulation	9.653	0.000
<i>FY 2023 Accomplishments:</i> Initiate and complete the integration of electronic warfare integrated reprogramming database models into the next generation threat system.		
<i>FY 2024 Plans:</i> N/A		
<i>Congressional Add:</i> Test capabilities accel. - PMRF data management modernization	19.307	0.000
<i>FY 2023 Accomplishments:</i> Initiate and complete the modernization of the Pacific Missile Range Facility and Mobile At-Sea Sensor unclassified and classified networks.		
<i>FY 2024 Plans:</i> N/A		
Congressional Adds Subtotals	36.683	0.000

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

N/A

Remarks

D. Acquisition Strategy

Not required for Congressional Adds