Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603654N *I JNT Service EOD Development*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	708.860	60.316	47.656	43.084	14.461	57.545	52.033	54.930	52.929	51.365	Continuing	Continuing
0377: *JT Service Expl Ord Disp System*	392.085	7.532	9.780	11.239	-	11.239	9.874	11.370	11.598	11.830	Continuing	Continuing
1317: *Expeditionary Diving Systems*	119.008	4.323	2.533	2.754	-	2.754	2.655	2.815	2.584	2.438	Continuing	Continuing
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	56.847	26.867	19.222	5.224	14.461	19.685	15.831	16.074	16.304	16.552	Continuing	Continuing
4023: *Expeditionary Underwater Systems*	140.920	16.770	16.121	23.867	-	23.867	23.673	24.671	22.443	20.545	Continuing	Continuing
9999: *Congressional Adds*	0.000	4.824	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.824

Note

The FY 2021 funding request was reduced by $0.933 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

This is a Joint Service Program.

This program provides for the development of Explosive Ordnance Disposal tools and equipment aimed at meeting National Defense Strategy guidance to build a more lethal force. The responsibility is assigned to the Navy as single service manager, per Department of Defense Directive 5160.62 of 15 May, 2017, for management of the Joint Service Explosive Ordnance Disposal Research and Development Program.

Proliferation of sophisticated types of foreign and domestic ordnance and Improvised Explosive Devices necessitate a continuing development program to provide Explosive Ordnance Disposal personnel of all military services with the tools and equipment designed for modularity, scalability, and flexibility, while maintaining readiness to respond to contingencies and ensure long-term warfighting readiness.

This program also provides life support related equipment necessary to support the performance of Navy Explosive Ordnance Disposal tasks underwater. This equipment must have inherently low acoustic and magnetic signatures in order to allow the Explosive Ordnance Disposal technician to safely approach, render-safe and dispose of sea mines and other underwater ordnance.

This program also supports the National Defense Strategy's objective of preventing terrorist and near peer operations against the US, allies, and partners by providing for the research and development of Electronic Warfare (EW) systems, equipment, procedures, and tactical aids for all military services against the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. It utilizes Joint

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603654N *I JNT Service EOD Development*

requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provides a Joint Counter RCIED EW (CREW) development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with the evolving RCIED global threat.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	61.757	33.478	48.523	-	48.523
Current President's Budget	60.316	47.656	43.084	14.461	57.545
Total Adjustments	-1.441	14.178	-5.439	14.461	9.022
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.005	0.000			
• SBIR/STTR Transfer	-1.437	0.000			
• Program Adjustments	0.001	14.178	-4.474	14.461	9.987
• Rate/Misc Adjustments	0.000	0.000	-0.965	-	-0.965

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *Breathing Apparatus for EOD Divers*	4.824	0.000
Congressional Add Subtotals for Project: 9999	4.824	0.000
Congressional Add Totals for all Projects	4.824	0.000

Change Summary Explanation

FY2020: OCO Request +$14.178M

FY 2021: Other Program Adjustments -$4.474M, Rate adjustments -$0.965M

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JNT Service EOD Development*	Project (Number/Name) 0377 / *JT Service Expl Ord Disp System*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0377: *JT Service Expl Ord Disp System*	392.085	7.532	9.780	11.239	-	11.239	9.874	11.370	11.598	11.830	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) Project (0377) provides funding for the detailed design, development, risk mitigation, issue resolution, integrations, test, test equipment, simulations and technology insertion of specialized equipment, tools and assessment of accessories that expand range of military operations required to support DoD's only Joint Explosive Ordnance Disposal (EOD) programs.

EOD exclusively executes world-wide missions for detection/location, identification, render-safe, recovery, field and laboratory evaluation, and disposal of hazards and unexploded ordnance (UXO) that is a threat to military operations, installations, personnel, or material. UXO includes foreign and domestic, both conventional and non-conventional, including Improvised Explosive Devices (IEDs) and devices using radiological and biological means with or without explosives.

The responsibility is assigned to the Navy as single service manager, by Department of Defense Directive 5160.62 for management of the Joint Service Explosive Ordnance Disposal Research and Development Program. EOD programs are designed to reduce the EOD operator's exposure to explosive hazards or limit the risk to an acceptable level. EOD operations range from hand entry of explosive devices by EOD technicians to robotic actions and sensing capabilities that provide a safe distance of the explosive hazard at a greatly reduced cost to trained and experienced EOD operators.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS)	1.258	4.900	1.500	0.000	1.500
Articles:	-	-	-	-	-
FY 2020 Plans: Develop EOD specific mobile applications and design interfaces to existing EOD approved mobile software applications. Conduct operation test and evaluation for prior to entry of Full Deployment Decision Review. In addition, develop a Learning Management System (LMS) with mobile application to support Joint Service EOD common skills training. Provides required Certification and Accreditations of the mobile applications as well as cloud hosting of apps and data for download by the EOD warfighter.					
FY 2021 Base Plans: Develop EOD specific mobile applications in Android, iOS, and Windows Operating Systems providing the EOD Warfighter with real-time technical manuals to aid in the interrogation of explosive threat devices and					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
decision-aid tools to counter those threats. Integration and testing of transitions mobile applications for ordnance recognition and senor compatibility for graphical user interface. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease is due to scheduled delivery and transition to sustainment.					
Title: ANALYSIS OF ALTERNATIVES/ EOD MODERNIZATION ***Articles:*** ***FY 2020 Plans:*** Implement Analysis of Alternatives (AOA) to assess warfighter identified capability gaps, specific to operational environments including threats and scenarios, alternative development approaches, operational concept development for technology maturity and insertion readiness. Conduct evaluation of technology readiness and technology transition Science and Technology relevant solutions for minimal development and prototype tools and equipment prior to fielding Joint EOD endorsed Statement of Operational Needs. ***FY 2021 Base Plans:*** Conduct the development of a suite of tools providing the capability for increased standoff distances for Explosives Ordnance Disposal (EOD) render Safe of Unexploded Ordnance and disruptor of complex and sophisticated threats while reducing risk of injury to the EOD warfighter and enhancing mission success. This effort will be accomplished through evaluation of commercial non-developmental items, analysis of alternatives, and maximized transition of ongoing Science and technology opportunities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increased funding addresses EOD mission threats through the implementation of technology advances, test and evaluation of new and transitioned technology for EOD tools, and equipment modernization replacing outdated and obsolete technology.	0.337 -	4.130 -	8.939 -	0.000 -	8.939 -
Title: EOD ROBOTICS ***Articles:*** ***FY 2020 Plans:***	5.937 -	0.750 -	0.800 -	0.000 -	0.800 -

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continued development for EOD specific modules and tech insertion for technology enhancements and Robotics continuous Improvements. ***FY 2021 Base Plans:*** Integration of sensors and Weapon Systems Explosive Safety Review Board (WSERB) safety approvals prior to fielding. Conduct test and evaluation for compatibility and integration for technology capability advancements. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Technology insertion for EOD Specific Modules and Senor capabilities on approved robotics platforms.					
Accomplishments/Planned Programs Subtotals	7.532	9.780	11.239	0.000	11.239

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Joint Service acquisition strategies maximize, to the greatest extent, evolutionary open architecture and modular strategy for rapid acquisition of mature technology for the user. The evolutionary approach delivers baseline capability and subsequent increments, recognizing up front the need for future capability improvements. Each increment is a militarily useful and supportable operational capability that can be developed, produced, deployed, and sustained. The evolutionary strategy allows for rapid block upgrades, pre-planned product improvements, new accessories that expand range of military operations that provide a significant increase in operational capability and improvements at the modular level and encourages competition and second sources to lower life cycle costs. Modeling and simulation can verify system level compliance in a laboratory, greatly reducing the cost to conduct expensive range testing. EOD Modernization increases technology advances for more capable diagnostics and render-safe systems and EOD tools. Analysis of Alternatives (AOA) studies and evaluations commercial and non-development items are conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the life-cycle. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWCIHEODTD : Indian Head, MD	196.055	0.000	Oct 2018	1.627	Nov 2019	4.039	Nov 2020	-		4.039	Continuing	Continuing	Continuing
Primary Hardware Development	C/FFP	Northrop Grumman : Herndon, VA	15.144	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Primary Hardware Development	C/FFP	John Hopkins, MD : Laurel, MD	5.700	4.583	Nov 2018	0.315	Nov 2019	0.750	Nov 2020	-		0.750	0.000	11.348	-
ILS	WR	NSWCIHEODTD : Indian Head, MD	49.490	0.300	Nov 2018	0.400	Nov 2019	0.450	Nov 2020	-		0.450	Continuing	Continuing	Continuing
Primary Hardware Development	C/FPIF	TBD : TBD	0.000	0.000		1.938	Nov 2019	0.000		-		0.000	0.000	1.938	-
Primary Software Development	WR	ARL/Army : Aberdeen Proving Ground	0.000	1.000	Dec 2018	2.500	Nov 2019	1.500	Nov 2020	-		1.500	0.000	5.000	-
Primary Hardware Development	MIPR	Dept of Energy : Albuquerque, NM	0.000	0.000		1.200	Jan 2020	1.700	Nov 2020	-		1.700	0.000	2.900	-
		Subtotal	266.389	5.883		7.980		8.439		-		8.439	Continuing	Continuing	N/A

Remarks

Primary Hardware and Software Development increases to address EOD mission threats and implements technology advances and complete evaluation and test of new and transitioned technology for EOD tools, equipment modernization, and Technology insertion for increases system modularity in response to reconnaissance and execution of tactical unmanned robotics requirements. Increased funds to incorporate sensors and technology transition against multiple platforms.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Peraton : Herndon, VA	8.683	0.367	Dec 2018	0.400	Nov 2019	0.400	Nov 2020	-		0.400	Continuing	Continuing	Continuing
		Subtotal	8.683	0.367		0.400		0.400		-		0.400	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWCIHEODTD : Indian Head, MD	78.219	0.900	Dec 2018	0.900	Nov 2019	0.800	Nov 2020	-		0.800	Continuing	Continuing	Continuing
Operation Test & Evaluation	WR	NSWCIHEODTD : Indian Head, MD	11.533	0.025	Nov 2018	0.025	Nov 2019	0.250	Nov 2020	-		0.250	Continuing	Continuing	Continuing
Operation Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.125	Nov 2019	0.500	Nov 2020	-		0.500	0.000	0.625	-
Developmental Test & Evaluation	C/FFP	NRL : Washington, DC	0.000	0.000		0.100	Jan 2020	0.350	Nov 2020	-		0.350	0.000	0.450	-
		Subtotal	89.752	0.925		1.150		1.900		-		1.900	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	10.809	0.357	Oct 2018	0.250	Oct 2019	0.200	Oct 2020	-		0.200	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWCIHEODTD : Indian Head, MD	16.452	0.000		0.000		0.300	Oct 2020	-		0.300	Continuing	Continuing	Continuing
		Subtotal	27.261	0.357		0.250		0.500		-		0.500	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	392.085	7.532		9.780		11.239		-		11.239	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

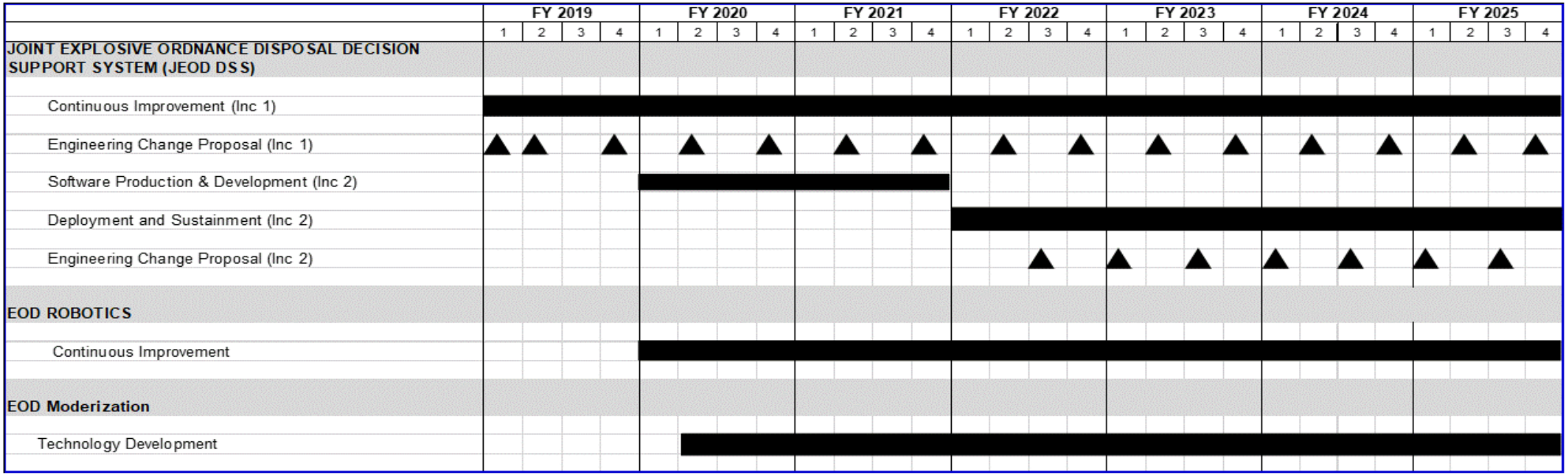

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0377				
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Continuous Improvement (Inc 1)	1	2019	4	2025
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 1 (Inc 1)	1	2019	1	2019
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 2 (Inc 1)	2	2019	2	2019
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 3 (Inc 1)	4	2019	4	2019
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 4 (Inc 1)	2	2020	2	2020
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 5 (Inc 1)	4	2020	4	2020
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 6 (Inc 1)	2	2021	2	2021
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 7 (Inc 1)	4	2021	4	2021
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 8 (Inc 1)	2	2022	2	2022
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 9 (Inc 1)	4	2022	4	2022
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 10 (Inc 1)	2	2023	2	2023
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 11 (Inc 1)	4	2023	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 12 (Inc 1)	2	2024	2	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 13 (Inc 1)	4	2024	4	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 14 (Inc 1)	2	2025	2	2025
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 15 (Inc 1)	4	2025	4	2025
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Software Production & Development (Inc 2)	1	2020	4	2021
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Deployment and Sustainment	1	2022	4	2025
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 1 (Inc 2)	3	2022	3	2022
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 2 (Inc 2)	1	2023	1	2023
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 3 (Inc 2)	3	2023	3	2023
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 4 (Inc 2)	1	2024	1	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 5 (Inc 2)	3	2024	3	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 6 (Inc 2)	1	2025	1	2025
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 7 (Inc 2)	3	2025	3	2025
EOD MODERIZATION: Technology Development	2	2020	1	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JNT Service EOD Development*	Project (Number/Name) 1317 / *Expeditionary Diving Systems*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
1317: *Expeditionary Diving Systems*	119.008	4.323	2.533	2.754	-	2.754	2.655	2.815	2.584	2.438	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

These resources support the development of equipment for the Navy's only comprehensive expeditionary detect to engage MCM capability. Specifically, it provides for development of Diver Safety/Life Support Equipment, Advanced Diver Integrated Sensors and Advanced Firing Systems to support Navy Explosive Ordnance Disposal (EOD) underwater operations, expeditionary salvage, and Expeditionary MCM Company operations by US Fleet Forces Command. The equipment must have inherently low acoustic and magnetic signatures in order to allow the EOD divers to safely reaquire, approach, render-safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, underwater improvised explosive devices, and unexploded ordnance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: DIVER SAFETY & LIFE SUPPORT SYSTEMS	2.000	2.150	1.765	0.000	1.765
Articles:	-	-	-	-	-
Description: Diver Safety & Life Support Systems: Develop diving equipment and diver safety tools to include life support systems for Explosive Ordnance Disposal (EOD), Expeditionary Mine Countermeasures (ExMCM), and Mobile Diving & Salvage Units (MDSU) operations. Specific tools include but are not limited to Underwater Breathing Apparatus (UBA), underwater handheld sonar, specialized dive masks, heads-up displays, emergency life support systems, and the capability to train divers and to evaluate ExMCM tools, tactics and procedures including control of signatures with regard to influence fired ordnance.					
FY 2020 Plans: Unmanned testing at Navy Experimental Dive Unit(NEDU) will commence leading to determination of suitability of candidate rigs prior to initiation of manned in-water testing. Efforts will continue the unmanned and manned testing needed to ensure that the UBAs selected in FY19 to address the capabilities defined by the approved Capability Definition Document (CDD) meet all required performance, safety, and user suitability thresholds. NEDU commercial environmental test chambers will be used to verify that applicable MIL-STD-810 environmental test conditions are met. The combined efforts are designed to ultimately support a source selection and NAVSEA 00C Certification of the selected UBA.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY21 efforts will be focused on completion of the user evaluations of the candidate system selected. These evaluations will determine the operational effectiveness and suitability characteristics of the Multi Mission Underwater Breathing Apparatus (MMUBA). Preparations for certification and production will ensue leading to a production decision this fiscal year. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease of $0.385M from FY2020 due to completion of Multi Mission Underwater Breathing Apparatus (MMUBA) developmental T&E and testing events at Navy Experimental Dive Unit (NEDU) as part of the required life support safety certification program prior to fielding any life support systems.					
Title: ADVANCED DIVER INTEGRATED SENSORS	1.958	0.293	0.864	0.000	0.864
Articles:	-	-	-	-	-
Description: Develop Advanced Diver Integrated Sensors equipment to enable EOD and MDSU ability to detect, access, neutralize and gather intelligence on underwater targets of interest in support of Expeditionary Mine Countermeasures (ExMCM) and Diving and Salvage missions. Requirements include the forthcoming STRIDENT (Diver held integrated navigation/sonar capability) CDD. ***FY 2020 Plans:*** ACAT designation and CDD will be approved. Initial candidate user evaluations conducted in FY19 will inform the development of the performance specification and source selection criteria to ensure that the candidate EDMs fully meet the required performance thresholds. ***FY 2021 Base Plans:*** FY21 efforts will focus on award of candidate Engineering Development Model (EDM) contracts and initiation of test and evaluation of the candidate EDMs against system performance specifications. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase of $0.571 from FY2020 due to purchase of initial STRIDENT prototypes and beginning of the developmental Test & Evaluation necessary to demonstrate capability of the systems to meet system performance specification and CDD thresholds.					
Title: ADVANCED FIRING SYSTEM	0.365	0.090	0.125	0.000	0.125
Articles:	-	-	-	-	-
Description: Develops next generation of remote underwater firing device to enable EOD technicians to neutralize or otherwise mitigate underwater ordnance hazards from a safe standoff distance. This capability enables an acoustic signal to travel from the surface to an in-water receiver to detonate explosive tools ISO ExMCM missions. Improvements from previous underwater firing systems include the ability to encrypt the acoustic signal to avoid inadvertent firing of other firing systems in the vicinity. ***FY 2020 Plans:*** Continue the development of the Mk 58 Mod 3 improved receiver subsystem. Test and evaluation of the initial prototypes will occur and preliminary Weapon System Safety Review Board (WSESRB) engagement will ensue to evaluate the design from a safety certification perspective. These new receivers will address existing capability shortcoming in the legacy MK 58 Mod 2 AFDs. ***FY 2021 Base Plans:*** Continue testing of the enhanced Acoustic Firing System (AFS) receiver subsystems. Pursue initial WSESRB certification to proceed to explosive testing in FY22. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant changes from FY2020.					
Accomplishments/Planned Programs Subtotals	4.323	2.533	2.754	0.000	2.754

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/0977a: *Underwater EOD Program (Cost Code UQ034)*	1.125	1.350	3.619	-	3.619	15.577	23.084	11.060	9.314	0.000	94.704
• OPN/0977b: *UW EOD (UQ038)*	6.700	2.450	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.574

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the sub-projects life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), nondevelopmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Maximum use of innovative contracting mechanisms will be assessed and pursued where applicable and in the best interest of the Navy.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activities : Not Specified	45.100	0.850	Nov 2018	0.455	Nov 2019	0.345	Nov 2020	-		0.345	Continuing	Continuing	Continuing
Software Development	WR	Multiple Activites : Not Specified	6.741	0.170	Nov 2018	0.065	Nov 2019	0.180	Nov 2020	-		0.180	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWCIHEODTD : Indian Head, MD	8.228	0.000		0.000		0.100	Nov 2020	-		0.100	0.000	8.328	-
ILS	WR	Multiple Activities : Not Specified	11.916	0.000		0.000		0.000		-		0.000	0.000	11.916	-
Systems Engineering	WR	NSWC : Panama City	3.724	0.702	Nov 2018	0.502	Nov 2019	0.655	Nov 2020	-		0.655	Continuing	Continuing	Continuing
Systems Engineering	WR	NIWC : San Diego	5.199	0.970	Nov 2018	0.581	Nov 2019	0.564	Nov 2020	-		0.564	Continuing	Continuing	Continuing
		Subtotal	80.908	2.692		1.603		1.844		-		1.844	Continuing	Continuing	N/A

Remarks

Increase in system engineering from FY20 to FY21 due to the delivery of initial STRIDENT prototypes and beginning of the developmental T&E necessary to demonstrate capability of the systems to meet system performance specification and CDD thresholds that will be managed by system engineers at NIWC San Diego; also, the increased volume of UBA testing events at Navy Experimental Dive Unit (NEDU) that is supported by system engineers at NSWC PCD and is part of the required life support safety certification program prior to fielding any life support systems.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support2	C/CPFF	PERATON : Herndon VA	8.448	0.450	Nov 2018	0.307	Nov 2019	0.310	Nov 2020	-		0.310	Continuing	Continuing	Continuing
		Subtotal	8.448	0.450		0.307		0.310		-		0.310	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	Multiple Activities : Not Specified	9.562	0.585	Nov 2018	0.289	Nov 2019	0.300	Nov 2020	-		0.300	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	Multiple Activities : Not Specified	1.560	0.000		0.000		0.000		-		0.000	0.000	1.560	-
		Subtotal	11.122	0.585		0.289		0.300		-		0.300	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	11.531	0.577	Nov 2018	0.334	Nov 2019	0.300	Nov 2020	-		0.300	0.000	12.742	-
Miscellaneous	WR	NSWC, Activities : Not Specified	6.986	0.019	Nov 2018	0.000	Nov 2019	0.000	Nov 2020	-		0.000	0.000	7.005	-
Acquisition Workforce Fund	Various	Various : Various	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
		Subtotal	18.530	0.596		0.334		0.300		-		0.300	0.000	19.760	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	119.008	4.323		2.533		2.754		-		2.754	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

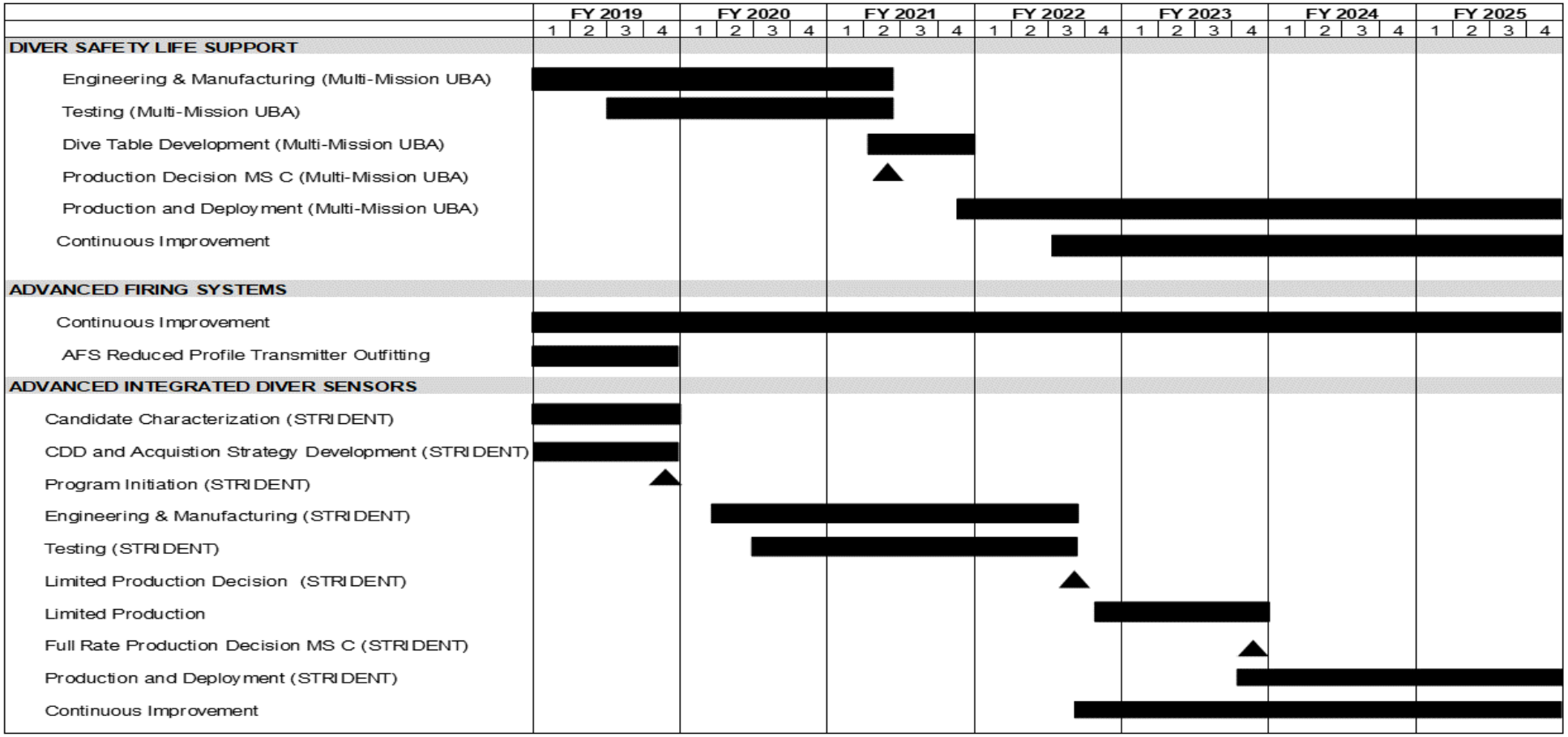

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 1317 / *Expeditionary Diving Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1317				
TITLE: DIVER SAFETY LIFE SUPPORT	1	2019	4	2025
---Engineering & Manufacturing (Multi-Mission UBA)	1	2019	2	2021
---Testing (Multi-Mission UBA)	3	2019	2	2021
---Dive Table Development (Multi-Mission UBA)	2	2021	4	2021
---Production Decision MS C (Multi-Mission UBA)	2	2021	2	2021
---Continuous Improvement_	3	2022	4	2025
TITLE: ADVANCED FIRING SYSTEMS	1	2019	4	2025
---Continuous Improvement.	1	2019	4	2025
---AFS Reduced Profile Transmitter Outfitting	1	2019	4	2019
TITLE: ADVANCED INTEGRATED DIVER SENSORS	1	2019	4	2025
--Candidate Characterization (STRIDENT)	1	2019	1	2019
---CDD and Acquisition Strategy Development (STRIDENT)	1	2019	4	2019
---Program Initiation (STRIDENT)	4	2019	4	2019
---Engineering & Manufacturing (STRIDENT)	2	2020	3	2022
---Testing (STRIDENT)	3	2020	3	2022
---Limited Production Decision	3	2022	3	2022
---Limited Production	4	2022	4	2023
---Full Rate Production Decision MS C (STRIDENT)	4	2023	4	2023
---Production and Deployment (STRIDENT)	4	2023	4	2025
---Continuous Improvement	3	2022	3	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JNT Service EOD Development*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	56.847	26.867	19.222	5.224	14.461	19.685	15.831	16.074	16.304	16.552	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the defense objective of preventing terrorist and near peer operations against the US, allies, and partners. It provides for the research and development of Electronic Warfare (EW) systems, equipment, procedures, and tactical aids for all military services to counter the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. It utilizes Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations, and develops; equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with the evolving global RCIED threat.

Joint Counter RCIED electronic Warfare (JCREW), Increment 1 Block 1 (I1B1) is the next generation of counter RCIED system of systems. JCREW includes fixed site, mounted and dismounted units, which provide countermeasures against the global RCIED threat. Key system design features include significant performance increases over current legacy systems, a modular open architecture system design to facilitate improvements to address current and future advanced threats, robust information assurance and security, and is net-capable for improved Communications and Control (C2). JCREW I1B1 supports global deployment and sustainment for all combatant commands providing increased protection to Warfighter against the evolving worldwide RCIED threats.

This project also provides for continued development and testing of JCREW Counter-Unmanned Aerial System (C-UAS) capabilities to support Joint Urgent Operational Need Statement(JUONS) CC-0558 and Fleet Forces Command C-UAS requirements. This includes the modification of JCREW hardware, software, threat loads, and advanced techniques, integration into JCREW systems, lab verification, and open air testing. Fielded JCREW systems will be upgraded with modified hardware, software and threat loads to keep pace with the evolving
C-UAS threat.

The EOD CREW project provides for the research, development, and systems engineering of EOD-specific CREW systems (AN/PLT-4 and AN/PLT-5). These systems are developed to meet unique CREW requirements established by the Joint EOD community. The funding also provides for capability improvements to both systems based on ever-changing RCIED threats against EOD technicians.

The Hemlock project provides for research, development, and systems engineering of electronic forensic capabilities related to the technical exploitation of asymmetric threats, including RCIEDs, unmanned systems, and underwater mines. The information generated is used to increase the performance of CREW and other counter-IED systems, as well as enable development of new countermeasure capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Joint Counter Radio-Controlled IED Elec Warfare	24.973	17.293	3.234	14.461	17.695
Articles:	-	-	-	-	-

Description: Supports the development, integration and test of Tech Insertion hardware, software, and advanced techniques into JCREW systems. Tech Insertion candidates include Office of Naval Research (ONR) sponsored technologies ready for transition to JCREW including the ENabling Dynamic Operational RF (ENDOR) Full Naval Capability (FNC); and techniques, hardware and software performance improvements developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Analysis of Alternatives (AoA) will be conducted to evaluate and select Tech Insertion candidates based on technical maturity, cost, and performance. Hardware and software updates will be integrated, tested, and implemented into JCREW through Engineering Change Proposals (ECPs).

FY 2020 Plans:
Development specifications, program plan, and contract vehicles for execution of development and integration of Tech Insertion 3 technologies in FY21. Tech Insertion 3 includes the refresh of the Software Defined Radio (SDR) module design that is required to enable software capabilities that are necessary for over 1,500 Navy JCREW I1B1 system to defeat emerging global RCIED threats, endangering US service personnel. Continue development and testing of threat loads, software, and hardware and processing associated ECPs.

$13.158M OCO funding supports Tech Insertion/Tech Refresh on JCREW systems to improve the C-UAS detect, identify, track, and defeat capabilities for JCREW systems deployed in support of JUON CC-0558 and Fleet Forces Command requirements. Continue development and testing of threat loads, software, and hardware and processing the associated ECPs to incorporate into JCREW systems.

FY 2021 Base Plans:
Begin and perform development and integration of Tech insertion 3 technologies, including the new SDR and several C-IED and C-UAS advanced threat techniques for dismounted, mounted, and fixed site JCREW I1B1 systems. Prepare for implementation and test of new SDR and advanced C-IED techniques in FY22. Develop analysis of alternatives, specifications, program plan, and contract vehicles for development and integration of Tech Insertion 4 technologies in FY22.

FY 2021 OCO Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Begin and perform development and integration of Tech insertion 3 technologies, including the new SDR and several C-IED and C-UAS advanced threat techniques for dismounted, mounted, and fixed site JCREW I1B1 systems. Prepare for implementation and test of new SDR and advanced C-IED techniques in FY22. Develop analysis of alternatives, specifications, program plan, and contract vehicles for development and integration of Tech Insertion 4 technologies in FY22. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease due to inadvertent FY 2020 Enacted add when Enduring Operations funding was moved from OCO to Base creating a positive wedge. Remaining funding supports the continued development of software load sets to keep pace with evolving C-sUAS threats.					
Title: EOD CREW	0.920	0.909	0.950	0.000	0.950
Articles:	-	-	-	-	-
FY 2020 Plans: Provide systems engineering support for EOD CREW systems. Develop AN/PLT-5 load sets to remain current with continually changing CONUS and OCONUS threats. Develop and validate AN/PLT-4 replacement requirements. ***FY 2021 Base Plans:*** Provide systems engineering support for EOD CREW systems. Develop AN/PLT-5 load sets to remain current with continually changing CONUS and OCONUS threats. Develop and validate AN/PLT-4 replacement requirements. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant change.					
Title: HEMLOCK	0.974	1.020	1.040	0.000	1.040
Articles:	-	-	-	-	-
FY 2020 Plans: OCO:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Develop hardware and software capabilities to enable enhanced cyber and electronics forensics and exploitation of evolving RCIED threats. Further information available at a higher classification. ***FY 2021 Base Plans:*** Develop hardware and software capabilities to enable enhanced cyber and electronics forensics and exploitation of evolving RCIED threats. Further information available at a higher classification. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No significant change.					
Accomplishments/Planned Programs Subtotals	26.867	19.222	5.224	14.461	19.685

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/5509(b): *Explosive Ordnance Disposal Equip*	25.736	0.868	0.877	-	0.877	0.894	20.912	20.931	0.950	0.000	206.567

Remarks

D. Acquisition Strategy

Develop, integrate, test, and field hardware and software upgrades, and advanced techniques into JCREW systems through the JCREW Tech Insertion / Tech Refresh process. Tech Insertion candidates include Office of Naval Research (ONR) sponsored technologies ready for transition to JCREW including the ENabling Dynamic Operational RF (ENDOR) Full Naval Capability (FNC); and techniques, hardware and software performance improvements developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Analysis of Alternatives (AoA) will be conducted to evaluate and select Tech Insertion candidates based on technical maturity, cost, and performance. Hardware and software updates will be integrated, tested, and implemented into JCREW through Engineering Change Proposals (ECPs). Also supports rapid development and testing of JCREW Counter-Unmanned Aerial System (C-UAS) for Joint Urgent Operational Need (JUON) CC-0558.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	Northrop Grumman : San Diego, CA	10.544	5.232	Jan 2019	3.354	Jan 2020	0.648	Jan 2021	2.870	Jan 2021	3.518	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Northrop Grumman : San Diego, CA	6.916	2.553	Jan 2019	1.724	Jan 2020	0.384	Jan 2021	1.330	Jan 2021	1.714	Continuing	Continuing	Continuing
Software Development	C/CPFF	Northrop Grumman : San Diego, CA	7.459	2.682	Jan 2019	1.714	Jan 2020	0.538	Jan 2021	1.647	Jan 2021	2.185	Continuing	Continuing	Continuing
System Integration	C/CPFF	Northrop Grumman : San Diego, CA	2.916	2.405	Jan 2019	1.525	Jan 2020	0.292	Jan 2021	1.296	Jan 2021	1.588	Continuing	Continuing	Continuing
		Subtotal	27.835	12.872		8.317		1.862		7.143		9.005	Continuing	Continuing	N/A

Remarks

FY20 to FY21 increase for the primary hardware and software development to support complex technical refresh of the software defined radio (SDR) module, while continuing CIED/CUAS advanced threat technique development for current threats and development of technical insertion 4 analysis of alternatives.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	FFRDC	JHU/APL, MITRE : Laurel, MD	5.096	1.858	Nov 2018	1.542	Nov 2019	0.345	Nov 2020	1.080	Nov 2020	1.425	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	9.421	6.834	Nov 2018	4.314	Nov 2019	1.333	Nov 2020	2.133	Nov 2020	3.466	Continuing	Continuing	Continuing
Program Management Support	WR	IHEODTD : Indian Head, MD	1.572	0.645	Nov 2018	0.636	Nov 2019	0.257	Nov 2020	0.364	Nov 2020	0.621	Continuing	Continuing	Continuing
Loadset Development	WR	IHEODTD : Indian Head, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	16.089	9.337		6.492		1.935		3.577		5.512	Continuing	Continuing	N/A

Remarks

FY20 to FY21 increase for the systems engineering necessary to support complex technical refresh of the software defined radio (SDR) module, while continuing CIED/CUAS advanced threat technique development for current threats and development of technical insertion 4 analysis of alternatives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWC : Various	6.666	1.927	Nov 2018	2.014	Nov 2019	0.810	Nov 2020	1.312	Nov 2020	2.122	Continuing	Continuing	Continuing
Test & Evaluation	MIPR	YPG : Yuma, Arizona	4.025	2.407	Nov 2018	1.726	Nov 2019	0.379	Nov 2020	1.622	Nov 2020	2.001	Continuing	Continuing	Continuing
		Subtotal	10.691	4.334		3.740		1.189		2.934		4.123	Continuing	Continuing	N/A

Remarks

FY20 to FY21 increase for the additional test and evaluation necessary to support complex technical refresh of the software defined radio (SDR) module, while continuing CIED/ CUAS advanced threat technique development for current threats and development of technical insertion 4 analysis of alternatives.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Cydecor : Various	1.015	0.000		0.350	Nov 2019	0.109	Nov 2020	0.321	Nov 2020	0.430	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC : Various	1.217	0.324	Nov 2018	0.323	Nov 2019	0.129	Nov 2020	0.486	Nov 2020	0.615	Continuing	Continuing	Continuing
		Subtotal	2.232	0.324		0.673		0.238		0.807		1.045	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	56.847	26.867		19.222		5.224		14.461		19.685	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

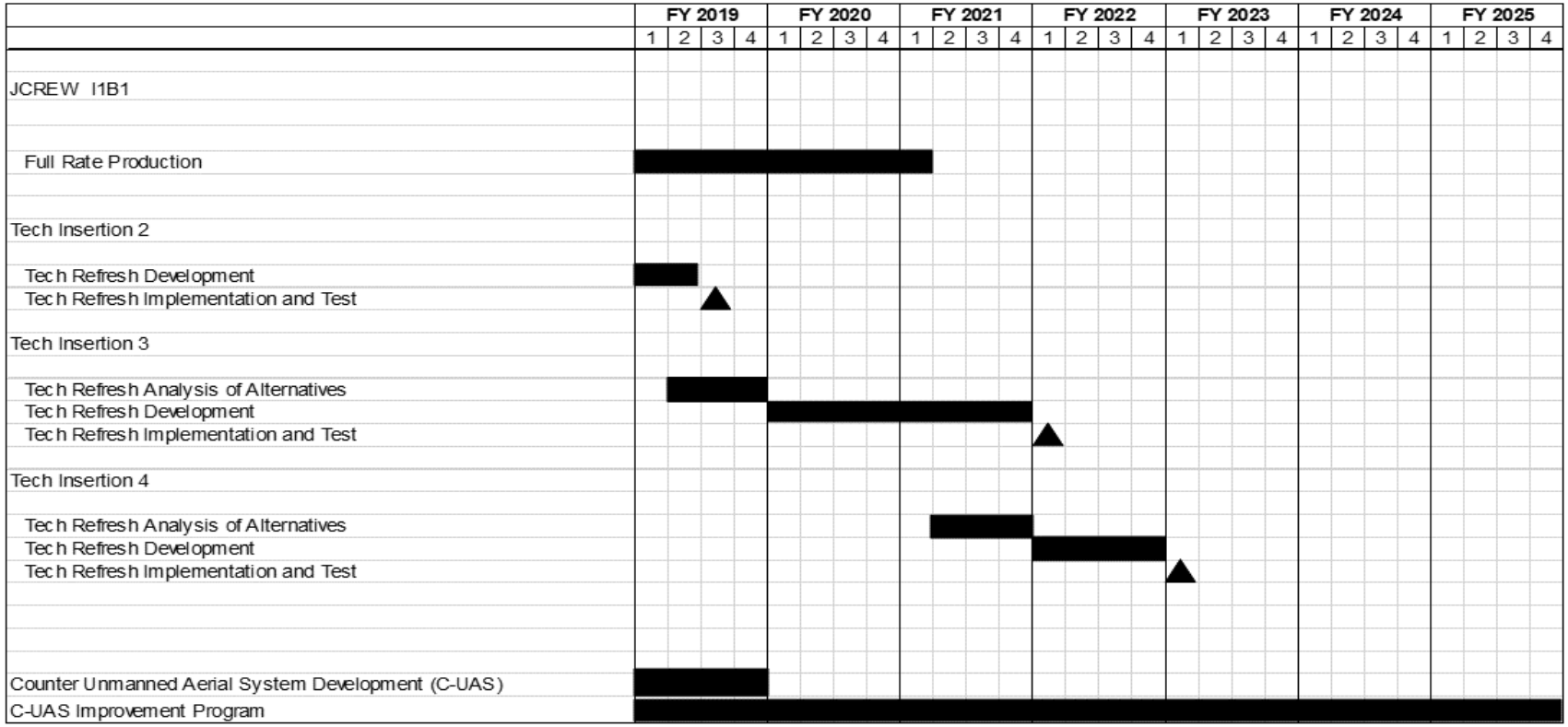

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

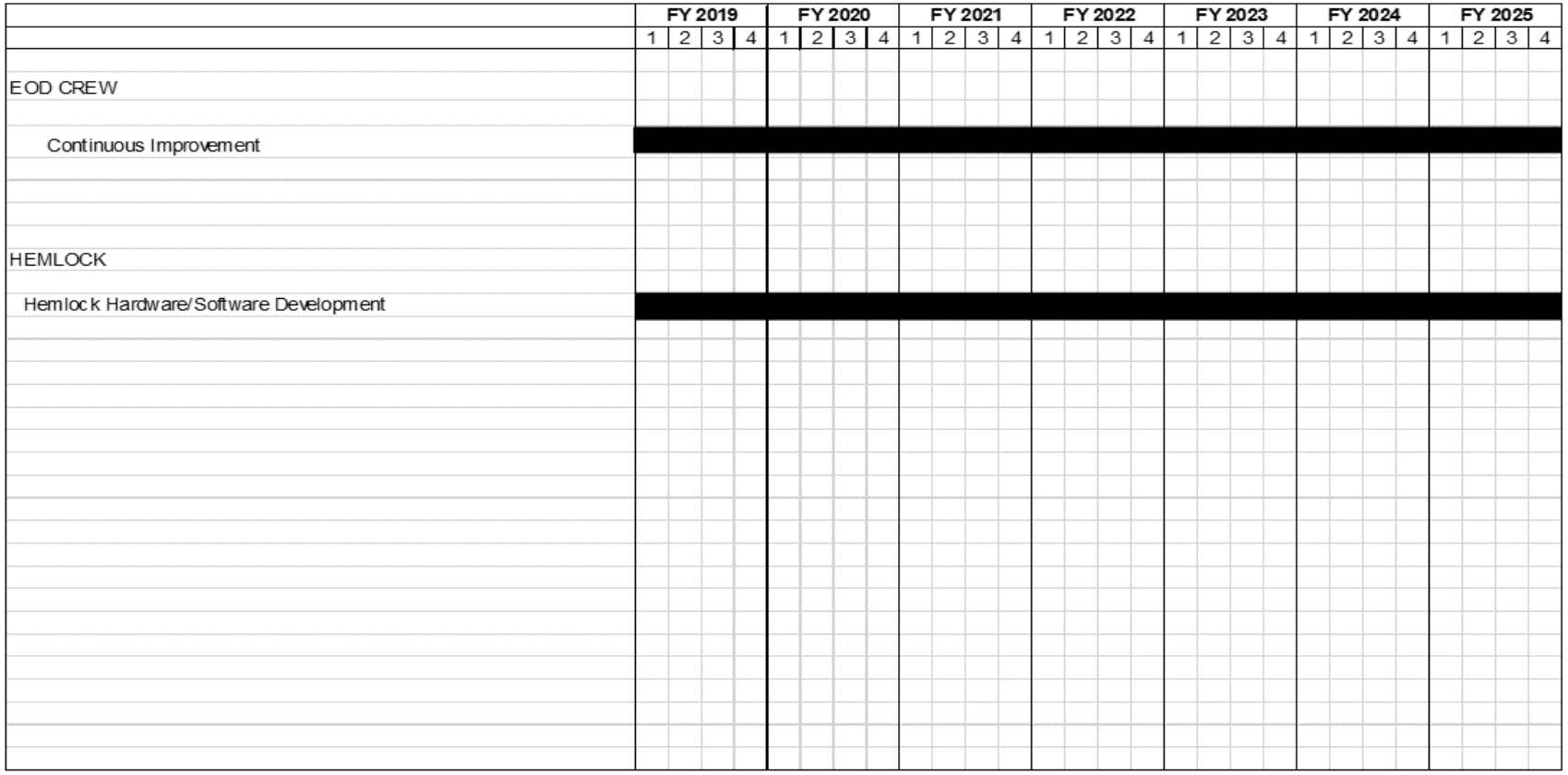

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3177				
JCREW I1B1: Full Rate Production	1	2019	1	2021
JCREW I1B1: TECH INSERTION 2	1	2019	3	2019
JCREW I1B1: Tech Refresh Development (2)	1	2019	2	2019
JCREW I1B1: Tech Refresh Implementation and Test (2)	3	2019	3	2019
JCREW I1B1: TECH INSERTION 3	2	2019	1	2022
JCREW I1B1: Tech Refresh Analysis of Alternatives (3)	2	2019	4	2019
JCREW I1B1: Tech Refresh Development (3)	1	2020	4	2021
JCREW I1B1: Tech Refresh Implementation and Test (3)	1	2022	1	2022
JCREW I1B1: TECH INSERTION 4	2	2021	1	2023
JCREW I1B1: Tech Refresh Analysis of Alternatives (4)	2	2021	4	2021
JCREW I1B1: Tech Refresh Development (4)	1	2022	4	2022
JCREW I1B1: Tech Refresh Implementation and Test (4)	1	2023	1	2023
JCREW I1B1: Counter Unmanned Aerial System Development	1	2019	4	2019
JCREW I1B1: C-UAS Improvement Program	1	2019	4	2025
EOD CREW: Continuous Improvement	1	2019	4	2025
EOD CREW: HEMLOCK	1	2019	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JNT Service EOD Development*	Project (Number/Name) 4023 / *Expeditionary Underwater Systems*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
4023: *Expeditionary Underwater Systems*	140.920	16.770	16.121	23.867	-	23.867	23.673	24.671	22.443	20.545	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding supports the development of unmanned systems for the Navy's expeditionary unmanned underwater Explosive Ordnance Disposal (EOD) and Mine Countermeasures (MCM) capability. Specifically, it provides for development of affordable expeditionary, unmanned underwater systems to support Navy Expeditionary forces including EOD, Mobile Diving and Salvage, Very Shallow Water (VSW), and Expeditionary Mine Countermeasures (ExMCM) mission operations. The equipment must be highly portable in order to support the Navy EOD technician to safely approach, render safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense and MCM, including clandestine reconnaissance and mine clearance in support of amphibious operations. Development of Expeditionary UUV systems to support localization render-safe and detailed intelligence gathering of unexploded ordnance (UXO) including Underwater Improvised Explosive Devices (IEDs). This project directly supports Department of the Navy Strategic Roadmap for Unmanned Systems promulgated in March 2018.

This budget provides the resources needed to execute two formal MK 18 Family of Systems acquisition programs as well as three major engineering change proposals and the enhancement to the MK 18 Family of Systems to provide an underwater threat interdiction capability. These efforts require prototype development as well as initiating the development and evaluation of the Next Generation competitive Small and Medium Class UUVs in response to requirements defined by the Maritime Expeditionary MCM UUV (MEMUUV) CDD.

FY21 will focus on continuation of the development and testing of advanced technologies that will allow warfighters to detect, classify, and localize high priority threats in meeting mine warfare missions. For example, the MK 18 Mod 2 Increment II upgrade will provide improved Automated Target Recognition (ATR) algorithms, more advanced autonomy architecture and continue to enhance electro-optic sensor performance. Increment II development and testing will focus on improving MCM performance and reducing the tactical timeline through development of a Reacquire, Identify and Mark capability for a Medium class UUV system. Concurrently with these efforts, the MK18 Mod 1 is undergoing a configuration change that will provide a higher area coverage rate, inclusion of vehicle autonomy, and Automated Target Recognition. Also, resources will continue to be used to expand deployability of the MK 18 Family of Systems (FoS) aboard a higher number of shipboard platforms and also to deploy the FoS from additional small boats and platforms other than the current 11 meter Rigid Hull Inflatable Boat (RHIB). These efforts will significantly improve the capabilities of the projected inventory of Small and Medium Class UUV systems for fleet Expeditionary MCM forces. Currently, the MK 18 Family of Systems are being employed in multiple theater of operations (5th, 6th, and 7th Fleet) and have been employed in multiple CONUS based port survey and maritime homeland defense operations as well.

Additional efforts will continue to execute the open competition process necessary to acquire and verify an EOD Response ROV capability focusing on user effectiveness and operational suitability to provide a ROV based target interdiction capability to address the capability gaps assessed in the previously conducted

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

Expeditionary UUV Neutralization System (EUNS) AoA. This next generation capability (i.e. modified-off-the-shelf (MOTS) ROV) is developed to decrease risk when reacquiring/investigating a potential threat (i.e. sea mine or Underwater IED).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: MK18 UUV Family of Systems	12.779	8.142	15.589	0.000	15.589
Articles:	-	-	-	-	-
Description: This program supports development, testing and Fleet approval for evolving generations of affordable, expeditionary Unmanned Underwater Vehicle (UUVs) systems to address validated requirements in support of Expeditionary SW and VSW UMCM mission areas defined by the Maritime Expeditionary MCM UUV (MEMUUV) Capability Description Document (CDD) approved in September 2017.					
FY 2020 Plans: FY20 will continue the development, testing, and evaluation of MK 18 Family of Systems. FY20 will focus on continuation of the development and testing of the Increment II program of record during the engineering and manufacturing development phase. In order to meet Fleet capacity and capability requirements, MEMUUV development is being accelerated to mitigate risk of future obsolescence of the MK18 platform and to take advantage of advances in UUV technology and modular open systems architecture. The rapid acquisition approach utilized for the development of the next generation small and medium class UUVs will form a technologically advanced baseline from which to develop future Increment III capabilities to detect, classify and localize high priority threats in meeting mine warfare missions.					
FY 2021 Base Plans: FY21 development of MEMUUV will focus on purchase and evaluation of prototype candidates and the delivery and initial engineering evaluation of the engineering development model of the Medium class UUV system. Additionally, the engineering and manufacturing development phase will continue to evaluate the operational effectiveness and suitability of the Increment II baseline. The technologies developed in Increment II will provide capability for both the legacy MK 18 platform and the MEMUUV Increment III systems. Events in FY21 will focus on demonstrating performance in operationally realistic environments with significant fleet user engagement.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Additionally, environmental testing will commence to demonstrate compliance with the system performance specification requirements. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $7.447M from FY2020 due to continuation of post-MS B Mk 18 Mod 2 Increment II developmental T&E as part of the engineering and manufacturing development (E&MD) phase and initiation of environmental testing of the EDM baseline configuration and development and testing of the prototype Medium Class MEMUUV Next Generation vehicles.					
Title: EOD Response ROVs and Maritime Expeditionary Standoff Response System of Systems	3.991	7.979	8.278	0.000	8.278
Articles:	-	-	-	-	-
Description: This program supports development, testing and evaluation of technologies and commercial systems that will provide needed capabilities to EOD and Expeditionary forces in responding to the wide range of underwater threats and operational environments encountered in assigned mission areas to include: confined areas, hulls, piers and pilings to search, classify, map, re-acquire, identify, and neutralize sea and limpet mines and underwater improvised explosive devices. ***FY 2020 Plans:*** FY20 will investigate and develop, test and evaluate enhancements to the selected MOTS ROV leading to an ECP decision regarding production and fielding of this interim EOD Response capability. Additionally, development and testing of the first generation MESR systems will continue. Component technologies will be integrated into three specific capability sets: Response Vehicle (RV) systems; standoff command and control modules; Task-Specialized Response Payloads. ***FY 2021 Base Plans:*** FY21 efforts will continue to evaluate the operational effectiveness and suitability of the MESR prototypes. Events in FY21 will focus on demonstrating performance in operationally realistic environments to demonstrate					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
compliance with the system performance specification requirements as well as testing emergent technologies and components that will reduce the system's magnetic, acoustic, or other influence signatures. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $299K from FY2020 due to resources aligned to test and reduce MESR influence.					
Accomplishments/Planned Programs Subtotals	16.770	16.121	23.867	0.000	23.867

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/0977(a): *Underwater EOD Program (Cost Code UQ034)*	1.850	0.000	4.715	-	4.715	1.939	0.546	0.000	4.200	0.000	157.498
• OPN/0977(b): *Expeditionary Mine Countermeasures (ExMCM) (Cost Code UQ038)*	32.515	32.310	3.903	-	3.903	5.163	10.723	2.175	0.000	0.000	98.185
• OPN/0977 (c): *MK18 Unmanned Underwater Vehicle (MK UUV) (Cost Code UQ040)*	19.440	25.746	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	67.236
• OPN/1611: *Expeditionary UUV (Cost Code MU002)*	0.000	0.000	29.604	2.946	32.550	17.116	9.530	9.721	9.915	0.000	78.832
• OPN/1611 MU003: *Expeditionary UUV (Cost Code MU003)*	0.000	0.000	0.000	-	0.000	0.000	8.358	12.006	14.553	0.000	34.917

Remarks

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisitions strategies of the most cost effective solution over the sub-projects' life -cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modifications), non-developmental item (including modifications), and lastly, developmental programs. Contracting for RDT&E, if required is competitive and when feasible, production options are included. This ongoing program capitalizes on a User Operational Evaluation System (UOES) effort involving Fleet operators engaged in tactical experimentation with prototype UUVs prior to fielding baseline systems and capability improvement package increments. These UUV operators also participate

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

in detailed requirements analyses and definition. Operational capabilities with UUVs have been realized at designated operational units, with a competitive acquisition strategy. The addition of enhanced capabilities through an evolutionary acquisition approach to the UUV toolbox is programmed for delivery in accordance with approved CNO requirements and ONR Technology Transition Agreements (TTAs) which close capability gaps. Further improvements to the toolbox to add basic mine and underwater explosive threats neutralization capabilities will continue to be pursued, including expansion of EOD Response capabilities employing Remotely Operated Vehicles (ROVs) in areas where current UUVs cannot operate. Streamlined acquisition initiatives are in place to quickly evaluate candidate EOD response capabilities while the longer term Maritime Expeditionary Response System of Systems is developed. A key attribute for these systems is minefield suitability and control of system signatures to counter influence fired ordnance. Influence signatures of subject UUVs and ROVs will be characterized as a vital component of the acquisition initiatives. Maximum use of innovative contracting mechanisms will be assessed and pursued where applicable and in the best interest of the Navy.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activities : Not Specified	26.862	3.588	Nov 2018	3.397	Nov 2019	5.465	Nov 2020	-		5.465	0.000	39.312	-
Systems Engineering	WR	NSWC Activities : Not Specified	17.656	2.613	Nov 2018	2.363	Nov 2019	4.410	Nov 2020	-		4.410	0.000	27.042	-
Primary Hardware Development	WR	NSWCIHEODTD : Indian Head, MD	16.238	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC, Activities : Not Specified	25.997	2.761	Nov 2018	2.524	Nov 2019	3.574	Nov 2020	-		3.574	Continuing	Continuing	Continuing
		Subtotal	86.753	8.962		8.284		13.449		-		13.449	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	PERATON : Herndon, VA	6.834	0.583	Nov 2018	0.528	Nov 2019	0.519	Nov 2020	-		0.519	Continuing	Continuing	Continuing
		Subtotal	6.834	0.583		0.528		0.519		-		0.519	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation-WR	WR	NSWC Activities : Not Specified	20.815	3.681	Nov 2018	3.604	Nov 2019	4.676	Nov 2020	-		4.676	0.000	32.776	-
Independent T&E	WR	NSWC Activities : Not Specified	6.096	1.763	Nov 2018	1.784	Nov 2019	1.820	Nov 2020	-		1.820	0.000	11.463	-
Developmental Test & Evaluation	WR	NSWC Activities : Not Specified	11.429	1.269	Nov 2018	1.272	Nov 2019	2.837	Nov 2020	-		2.837	Continuing	Continuing	Continuing
Independent T&E	WR	NSWCIHEODTD : Indian Head, MD	1.424	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	39.764	6.713		6.660		9.333		-		9.333	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	4.996	0.354	Nov 2018	0.528	Nov 2019	0.344	Nov 2020	-		0.344	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC Activities : Not Specified	2.555	0.158	Nov 2018	0.121	Nov 2019	0.222	Nov 2020	-		0.222	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
		Subtotal	7.569	0.512		0.649		0.566		-		0.566	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	140.920	16.770		16.121		23.867		-		23.867	Continuing	Continuing	N/A

Remarks

FY19 and FY20 efforts include use of Defense Innovation Unit (DIU) Other Transactional Agreements (OTAs) to support rapid fielding of MOTS EOD response ROVS and Small UUV Next Generation systems

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

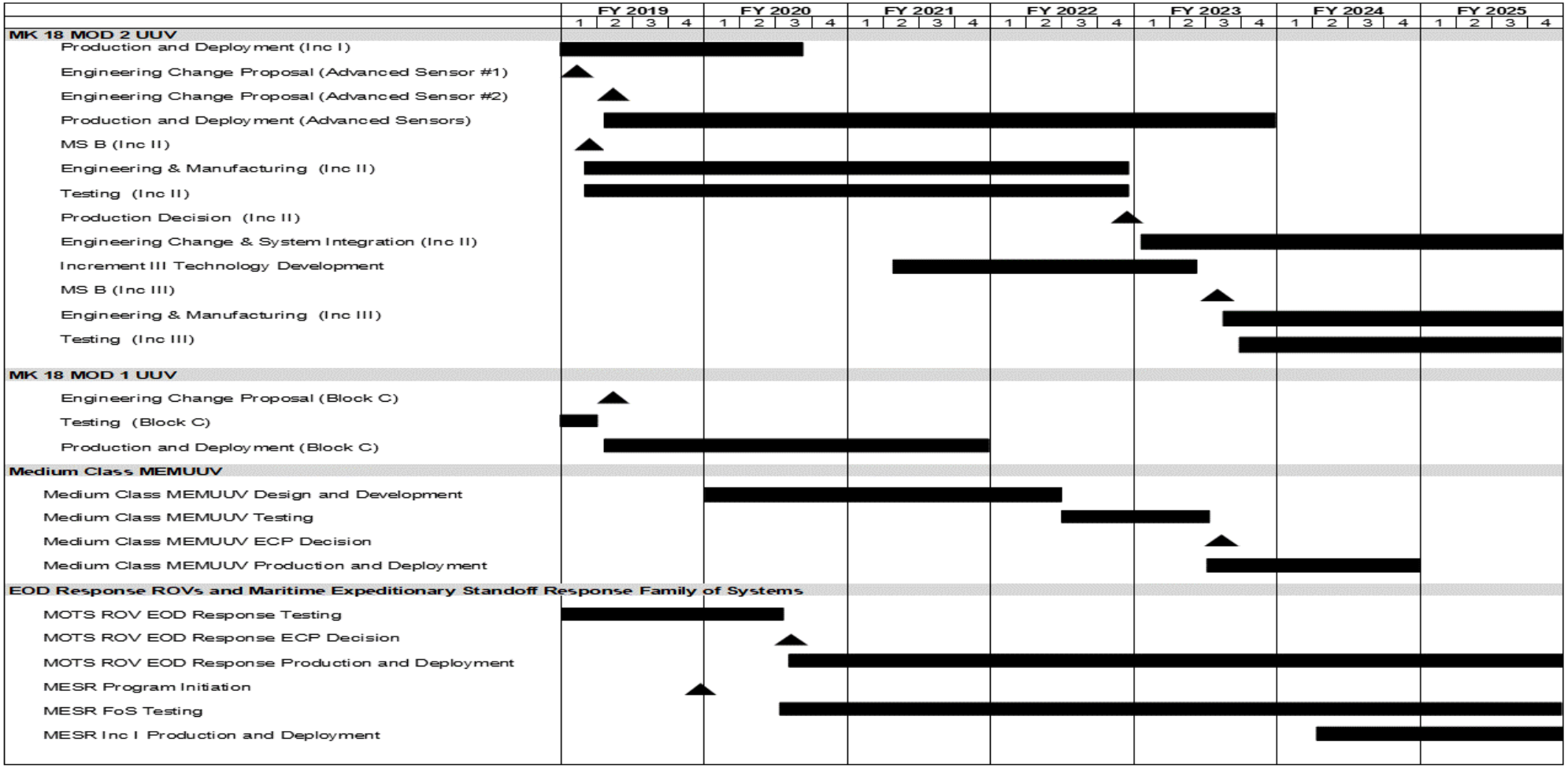

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4023				
TITLE: MK 18 MOD 2 UUV	1	2019	4	2025
---Production and Deployment (Inc 1)	1	2019	3	2020
---Engineering Change Proposal (Advanced Sensors #1)	1	2019	1	2019
---Engineering Change Proposal (Advanced Sensors #2)	2	2019	2	2019
---Production and Deployment Advanced Sensors)	2	2019	4	2023
---MS B (Inc II)	1	2019	1	2019
---Engineering & Manufacturing (Inc II)	2	2019	4	2022
---Testing (Inc II)	2	2019	4	2022
---Production Decision (Inc II)	4	2022	4	2022
---Engineering Change & System Integration (Inc II)	1	2023	4	2025
---Increment III Technology Development	2	2021	2	2023
---MS B (Inc III)	3	2023	3	2023
---Engineering & Manufacturing (Inc III)	3	2023	4	2025
---Testing (Inc III)	4	2023	4	2025
TITLE: MK 18 MOD 1 UUV	1	2019	4	2021
---Engineering Change Proposal (Block C)	2	2019	2	2019
---Testing (Block C)	1	2019	2	2019
---Production and Deployment (Block C)	2	2019	4	2021
-TITLE: Medium Class MEMUUV	1	2020	4	2024
----Medium Class MEMUUV Design and Development	4	2020	2	2022
----Medium Class MEMUUV Testing	3	2022	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 4023 / *Expeditionary Underwater Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
----Medium Class MEMUUV ECP Decision	3	2023	3	2023
----Medium Class MEMUUV Production and Deployment	3	2023	4	2024
TITLE: EOD RESPONSE (ROV)	1	2019	4	2025
---MOTS ROV EOD Response Testing	1	2019	2	2020
---MOTS ROV EOD Response ECP Decision	3	2020	3	2020
---MOTS ROV EOD Response Production and Deployment	3	2020	4	2025
---MESR Program Initiation	4	2019	4	2019
---MESR FoS Testing	3	2020	4	2025
---MESR Inc I Production and Deployment	2	2024	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JNT Service EOD Development*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	4.824	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.824
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop, acquire, test, and evaluate diver life support systems and diving safety tools and equipment to provide more effective and suitable capabilities to conduct EOD, and Mobile Diving & Salvage Units (MDSU) operations in emergent, high priority underwater missions. Specific tools and equipment include but are not limited to Underwater Breathing Apparatus (UBAs), specialized dive masks, heads-up displays, emergency life support systems and the ability to train divers and to evaluate Mine Countermeasures (MCM)/Explosive Ordnance Disposal (EOD) tools, tactics and procedures including control of signatures with regard to influence fired ordnance both in homeland waters and in controlled threat areas.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: Breathing Apparatus for EOD Divers	4.824	0.000
FY 2019 Accomplishments: Efforts will focus on acceleration of the MMUBA acquisition program (MOTS UBA, MK 16 PIP) and diver safety life support enhancements through acquisition of additional prototypes, more rapid acquisition of long lead components for MK 16 UBA PIP and acceleration of bench testing, field demonstrations and environmental evaluation. This funding will significantly enhance the ability to deliver the capabilities defined by the CNO approved MMUBA Capability Definition Document (CDD) of May 2018.		
FY 2020 Plans: N/A		
Congressional Adds Subtotals	4.824	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the sub-projects life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non- developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Maximum use of innovative contracting mechanisms will be assessed and pursued where applicable and in the best interest of the Navy.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 9999 / *Congressional Adds*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	PERATON : Herndon, VA	0.000	0.828	Nov 2018	0.000		0.000		-		0.000	0.000	0.828	-
		Subtotal	0.000	0.828		0.000		0.000		-		0.000	0.000	0.828	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC : Panama City	0.000	3.996	Nov 2018	0.000		0.000		-		0.000	0.000	3.996	-
		Subtotal	0.000	3.996		0.000		0.000		-		0.000	0.000	3.996	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NSWCIHEODTD : Indian Head, MD	0.000	0.000	Nov 2018	0.000		0.000		-		0.000	0.000	0.000	-
Miscellaneous	WR	NSWCIHEODTD : Indian Head, MD	0.000	0.000	Nov 2018	0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.824		0.000		0.000		-		0.000	0.000	4.824	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

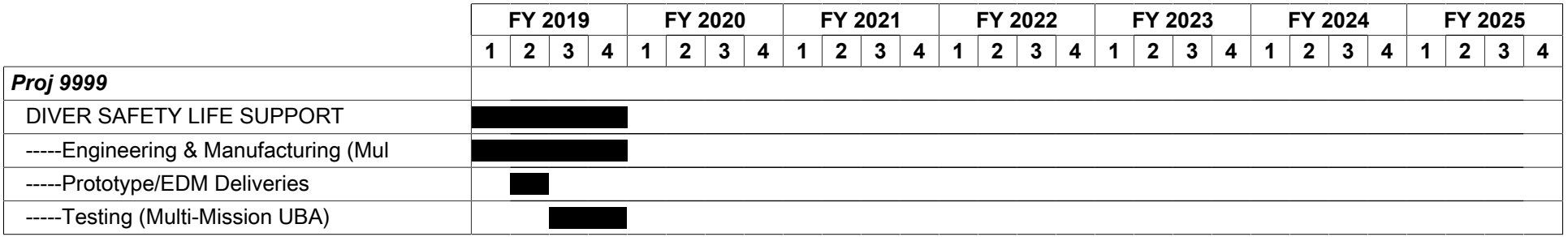

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JNT Service EOD Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
DIVER SAFETY LIFE SUPPORT	1	2019	4	2019
-----Engineering & Manufacturing (Mul	1	2019	4	2019
-----Prototype/EDM Deliveries	2	2019	2	2019
-----Testing (Multi-Mission UBA)	3	2019	4	2019