Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
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 JT Service Explosive Ordn Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	631.450	77.409	61.757	33.478	14.178	47.656	62.984	56.524	61.191	62.414	Continuing	Continuing
0377: *JT Service Expl Ord Disp System*	379.039	13.046	7.839	9.780	-	9.780	11.247	9.882	11.377	11.604	Continuing	Continuing
1317: *EOD Diving System*	113.915	5.093	4.357	2.533	-	2.533	5.652	4.644	4.708	4.800	Continuing	Continuing
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	13.194	43.652	27.625	5.044	14.178	19.222	29.858	26.316	26.889	27.430	Continuing	Continuing
4023: *VSW MCM/Force Protection UUV*	125.302	15.618	16.936	16.121	-	16.121	16.227	15.682	18.217	18.580	Continuing	Continuing
9999: *Congressional Adds*	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000

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's guidance to build a more lethal force. The responsibility is assigned to the Navy as single service manager, by 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 provides 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. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide 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 evolving global threat.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
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 JT Service Explosive Ordn Dev*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	53.367	43.148	51.725	-	51.725
Current President's Budget	77.409	61.757	33.478	14.178	47.656
Total Adjustments	24.042	18.609	-18.247	14.178	-4.069
• Congressional General Reductions	-	-0.291			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.100	0.000			
• Program Adjustments	29.700	27.800	-17.378	14.178	-3.200
• Rate/Misc Adjustments	0.000	-13.900	-0.869	-	-0.869
• Congressional General Reductions Adjustments	-0.058	-	-	-	-
• Congressional Directed Reductions Adjustments	-3.500	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 9999: *Congressional Adds*		
Congressional Add: *Breathing Apparatus for EOD Divers*	0.000	5.000
Congressional Add Subtotals for Project: 9999	0.000	5.000
Congressional Add Totals for all Projects	0.000	5.000

Change Summary Explanation

FY2020: Other Program Adjustments Addition, $14.178 million for enduring operations in base.

FY2020: Other Rate/Misc Adjustments(MISC), funding request was reduced by $17.378 million to account for the availability of prior year under execution and $869K for miscellaneous adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 0377 / *JT Service Expl Ord Disp System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
0377: *JT Service Expl Ord Disp System*	379.039	13.046	7.839	9.780	-	9.780	11.247	9.882	11.377	11.604	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 post-deployment improvements 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); hazards includes fuels weapons and weapons of mass destruction 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 of 3 June 2011, 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS)	2.296	1.258	4.900	0.000	4.900
Articles:	-	-	-	-	-
FY 2019 Plans: Continue the EOD Warfighter defined improvements to the JEOD DSS Common Controller Portals and Mobile Field Kit software. Complete migrations from Navy Enterprise Data Center to Cloud Support Services Platforms. Continue development of Mobile applications specific to EOD.					
FY 2020 Base Plans: Develop EOD specific mobile applications and design interfaces to existing EOD approved mobile software applications. Finalize migration from Navy Enterprise Data Center to Cloud support services platforms.					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 increase ($+3.642M) reflects funding of software development efforts required for software mobile applications.					
Title: ANALYSIS OF ALTERNATIVES/ EOD MODERNIZATION	0.000	0.337	1.464	0.000	1.464
Articles:	-	-	-	-	-
FY 2019 Plans: Conduct evaluation of technology readiness for sub-surface Ordnance and Improvised Explosive devices Locators, and for Detect and Locate requirements in support of Joint EOD endorsed Statement of Operational Needs.					
FY 2020 Base Plans: Implement Analysis of Alternatives (AOA) to assess warfighter identified capability gaps, review the operational environments including threats and scenarios, alternative development approaches, operational concept development for technology maturity and insertion readiness. Conduct evaluation of technology readiness for Joint EOD endorsed Statement of Operational Needs.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY2019 to FY2020 ($+1.127M) for development of Diagnostics, Neutralization and render safe tools and equipment in response to statement of operational needs.					
Title: EOD ROBOTICS	9.430	6.244	3.416	0.000	3.416
Articles:	-	-	-	-	-
FY 2019 Plans: Complete technical insertion plans and engineering improvements plans for AEODRS. Finalize development configuration AEODRS Production Configuration for Low Rate Initial Production and user suitability assessments.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continued development for EOD specific modules and tech insertion for technology enhancements and Robotics continuous Improvements. Prototyping efforts for AEODRS will continue and will inform planned Critical Design Review. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 decrease ($-2.828M) due to AEODRS INC 2 RFP release on hold, based on Revalidation of requirements and evaluation of corresponding material solution and acquisition approach.					
Title: TCM AN/PLT-XXX SYSTEMS ***Articles:*** ***FY 2019 Plans:*** Technical adjustment to Project 3177. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A	1.320 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	13.046	7.839	9.780	0.000	9.780

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/5509(a): *EOD Equipment (VN075)*	0.000	2.500	9.237	-	9.237	5.579	5.771	6.039	6.262	0.000	63.626

Remarks

D. Acquisition Strategy

Joint Service acquisition strategies utilize an 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 open architecture and modular strategy allows for rapid block upgrades, pre-planned product improvements, new accessories that expand range of military operations that provide a significant increase

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

in operational capability and improvements at the modular level and encourages competition and second sources to lower life cycle costs. Once deployed, the upgrades can be developed, tested and deployed at the modular level and new capabilities can be delivered without having to return the entire tool (e.g. robot) to a depot for system level conversion. System Test bed and modeling and simulation can verify module 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 are conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the subprojects' life-cycle. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

E. Performance Metrics

Implemented 6 Engineering Changes which addressed 121 Functional Change Requests and 136 Continuous Improvement Change Requests to the Joint Service EOD Decision Support System (DSS). Delivered 1850 DSS Mobile Field Kit (MFK) Software DVDs, 1814 Unclassified Automated EOD Publication System (AEODPS) and 1834 Secret AEODPS DVDs to Joint Service EOD. Developed and delivered DSS Unclassified Portal and subset of software mobile apps to be hosted via DISA MilCloud with 3224 current Joint Service EOD registered users.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWCIHEODTD : Indian Head, MD	193.409	2.646	Nov 2017	0.000	Nov 2018	3.067	Nov 2019	-		3.067	Continuing	Continuing	Continuing
Primary Hardware Development	C/FFP	Northrop Grumman : Herndon, VA	12.544	2.600	Nov 2017	0.000	Nov 2018	0.000	Nov 2019	-		0.000	Continuing	Continuing	Continuing
Primary Hardware Development	C/FFP	John Hopkins, MD : Laurel, MD	0.000	5.700	Nov 2017	4.847	Nov 2018	0.000	Nov 2019	-		0.000	0.000	10.547	-
ILS	WR	NSWCIHEODTD : Indian Head, MD	49.090	0.400	Nov 2017	0.300	Nov 2018	0.400	Nov 2019	-		0.400	Continuing	Continuing	Continuing
Primary Hardware Development	C/FPIF	TBD : TBD	0.000	0.000		0.000	Nov 2018	2.088	Nov 2019	-		2.088	0.000	2.088	-
Primary Software Development	WR	ARL/Army : Aberdeen Proving Ground	0.000	0.000		1.000	Nov 2018	2.500	Nov 2019	-		2.500	0.000	3.500	-
		Subtotal	255.043	11.346		6.147		8.055		-		8.055	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Peraton : Herndon, VA	8.308	0.375	Nov 2017	0.367	Nov 2018	0.400	Nov 2019	-		0.400	Continuing	Continuing	Continuing
		Subtotal	8.308	0.375		0.367		0.400		-		0.400	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWCIHEODTD : Indian Head, MD	77.319	0.900	Nov 2017	0.900	Dec 2018	0.900	Nov 2019	-		0.900	Continuing	Continuing	Continuing
Operation Test & Evaluation	WR	NSWCIHEODTD : Indian Head, MD	11.508	0.025	Nov 2017	0.025	Nov 2018	0.025	Nov 2019	-		0.025	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	88.827	0.925		0.925		0.925		-		0.925	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Managementt Support	WR	NSWCIHEODTD : Indian Head, MD	10.409	0.400	Nov 2017	0.400	Nov 2018	0.400	Nov 2019	-		0.400	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWCIHEODTD : Indian Head, MD	16.452	0.000		0.000	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	26.861	0.400		0.400		0.400		-		0.400	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	379.039	13.046		7.839		9.780		-		9.780	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

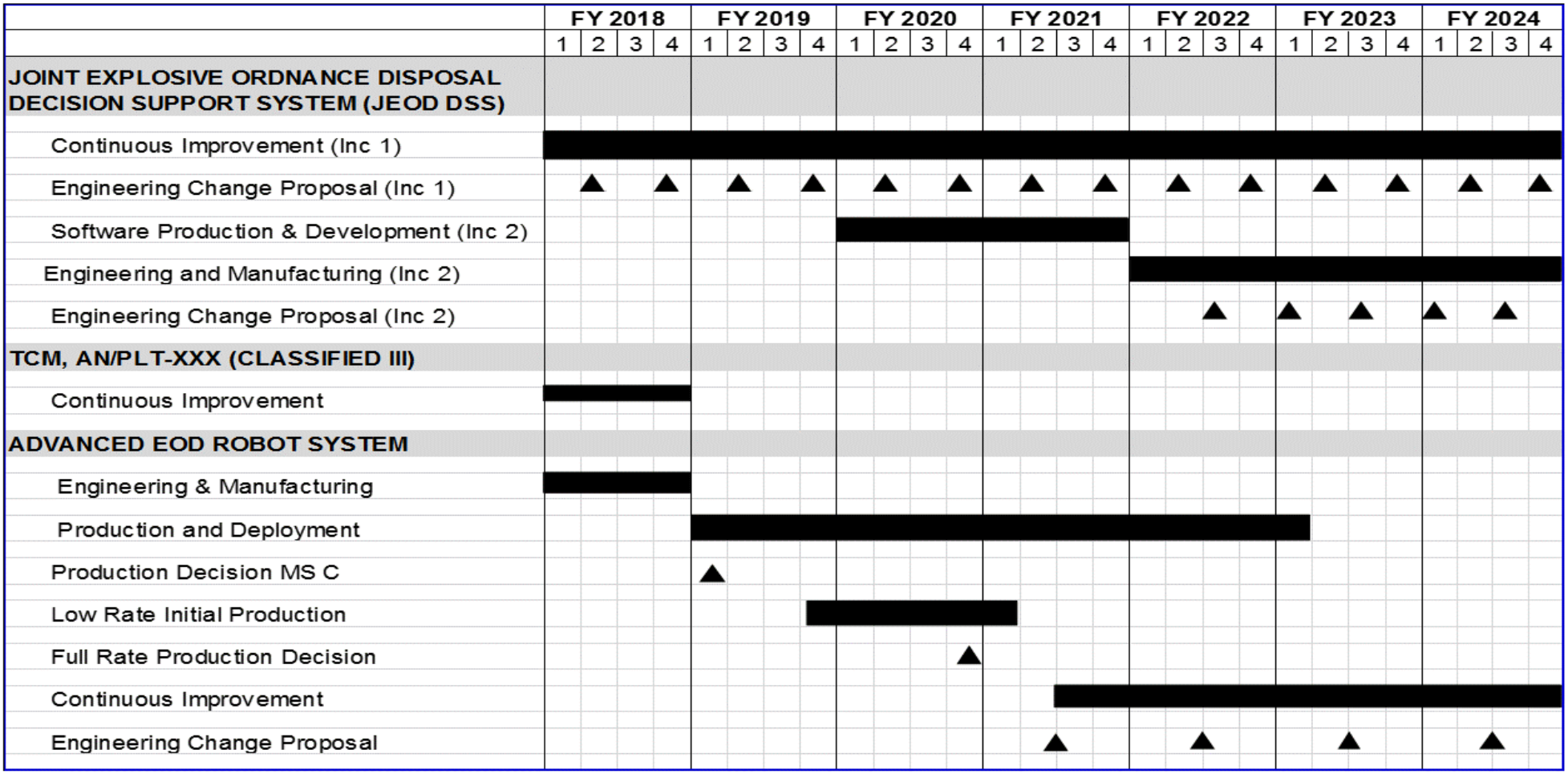

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

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	2018	4	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 1 (Inc 1)	2	2018	2	2018
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 2 (Inc 1)	4	2018	4	2018
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 3 (Inc 1)	2	2019	2	2019
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 4 (Inc 1)	4	2019	4	2019
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 5 (Inc 1)	2	2020	2	2020
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 6 (Inc 1)	4	2020	4	2020
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 7 (Inc 1)	2	2021	2	2021
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 8 (Inc 1)	4	2021	4	2021
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 9 (Inc 1)	2	2022	2	2022
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 10 (Inc 1)	4	2022	4	2022
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 11 (Inc 1)	2	2023	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**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)	4	2023	4	2023
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 13 (Inc 1)	2	2024	2	2024
JOINT EXPLOSIVE ORDNANCE DISPOSAL DECISION SUPPORT SYSTEM (JEOD DSS): Engineering Change Proposal 14 (Inc 1)	4	2024	4	2024
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): Engineering & Manufacturing (Inc 2)	1	2022	4	2024
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
TCM, AN/PLT-XXX (CLASSIFIED III): Continuous Improvement	1	2018	4	2018
ADVANCED EOD ROBOT SYSTEM: Engineering & Manufacturing	1	2018	4	2018
ADVANCED EOD ROBOT SYSTEM: Production and Deployment	1	2019	1	2023
ADVANCED EOD ROBOT SYSTEM: Production Decision MS C	1	2019	1	2019
ADVANCED EOD ROBOT SYSTEM: Low Rate Inital Production	4	2019	1	2021
ADVANCED EOD ROBOT SYSTEM: Full Rate Production Decision	4	2020	4	2020
ADVANCED EOD ROBOT SYSTEM: Continuouse Improvement	3	2021	4	2024
ADVANCED EOD ROBOT SYSTEM: Engineering Change Proposal 1	3	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 0377 / *JT Service Expl Ord Disp System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED EOD ROBOT SYSTEM: Engineering Change Proposal 2	3	2022	3	2022
ADVANCED EOD ROBOT SYSTEM: Engineering Change Proposal 3	3	2023	3	2023
ADVANCED EOD ROBOT SYSTEM: Engineering Change Proposal 4	3	2024	3	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 1317 / *EOD Diving System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1317: *EOD Diving System*	113.915	5.093	4.357	2.533	-	2.533	5.652	4.644	4.708	4.800	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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: DIVER SAFETY & LIFE SUPPORT SYSTEMS	2.930	2.000	2.150	0.000	2.150
Articles:	-	-	-	-	-
Description: Diver Safety & Life Support Systems: Develop diver safety tools to include more capable life support systems for EOD, and Mobile Diving & Salvage Units (MDSU) operations. Specific tools include but are not limited to Underwater Breathing Apparatus (UBA), 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.					
FY 2019 Plans: Efforts will focus on continuation of the MMUBA acquisition program (MOTS UBA, MK 16 PIP) and diver safety life support enhancements identified through continued engagement with Fleet EOD diving and expeditionary salvage forces.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
This program will develop the capabilities defined by the CNO approved MMUBA Capability Definition Document (CDD) of May 2018. Unmanned testing at NEDU will commence leading to determination of suitability of candidate rigs prior to initiation of manned in-water testing. MMUBA will receive an acquisition designation in FY19. ***FY 2020 Base Plans:*** 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 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. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY19 to FY20.					
Title: ADVANCED DIVER INTEGRATED SENSORS	1.920	1.958	0.293	0.000	0.293
Articles:	-	-	-	-	-
Description: Develop Advanced Diver Integrated Sensors equipment to enhance EOD and MDSU ability to detect, access, neutralize and gather intelligence on underwater targets of interest. Requirements include STRIDENT and improvements to the MK 15 Underwater Imaging System (UIS). ***FY 2019 Plans:*** CDD and acquisition strategy will be developed for STRIDENT. Engineering Development Model (EDM) Course of Action (COA) will be approved by the Milestone Decision Authority (MDA). Efforts will focus on completing the enhancements needed to continue MK 15 UIS capability until STRIDENT capability is fielded. Complete characterization of candidate					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
performance and minefield suitability including influence signatures. ***FY 2020 Base 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 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease from FY19 to FY20 due to completion of FY19 characterizations; DT&E will resume in FY21 upon selection of EDM candidates.					
Title: ADVANCED FIRING SYSTEM ***Articles:*** ***Description:*** Develops product improvements to existing systems for below and above water neutralization of underwater threats to support EOD and MDSU operations. ***FY 2019 Plans:*** Continuing development, testing, and evaluation of product improvements to the MK 12 Acoustic Firing System (AFS) receiver subsystems. ***FY 2020 Base Plans:*** Complete the testing of product improvements to the AFS receiver subsystems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY19 to FY20	0.243 -	0.399 -	0.090 -	0.000 -	0.090 -
Accomplishments/Planned Programs Subtotals	5.093	4.357	2.533	0.000	2.533

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/0977a: *Underwater EOD Program (Cost Code UQ034)*	1.100	1.125	1.350	-	1.350	2.095	1.645	2.119	5.790	0.000	43.699
• OPN/0977b: *UW EOD (UQ036)*	0.475	0.660	0.660	-	0.660	0.660	3.950	4.010	4.033	0.000	18.397

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.

E. Performance Metrics

CNO approved requirements documents that define necessary Key Performance Parameters (KPPs) and additional system attributes will be used to verify and validate operational effectiveness and suitability through component and system level test and evaluation to locate, classify, identify, assess, neutralize and conduct post-neutralization battle damage
assessment/verification of mines and unexploded ordnance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activities : Not Specified	44.150	0.950	Oct 2017	0.850	Nov 2018	0.455	Nov 2019	-		0.455	Continuing	Continuing	Continuing
Software Development	WR	Multiple Activites : Not Specified	6.533	0.208	Oct 2017	0.170	Nov 2018	0.065	Nov 2019	-		0.065	Continuing	Continuing	Continuing
Systems Engineering	WR	Multiple Activities : Not Specified	8.228	0.000		0.000		0.000		-		0.000	0.000	8.228	-
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	2.845	0.879	Oct 2017	0.702	Nov 2018	0.502	Nov 2019	-		0.502	Continuing	Continuing	Continuing
Systems Engineering	WR	SPAWAR : San Diego	4.010	1.189	Oct 2017	0.970	Nov 2018	0.581	Nov 2019	-		0.581	Continuing	Continuing	Continuing
		Subtotal	77.682	3.226		2.692		1.603		-		1.603	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support2	C/CPFF	PERATON : Herndon VA	7.938	0.510	Nov 2017	0.450	Nov 2018	0.307	Nov 2019	-		0.307	Continuing	Continuing	Continuing
		Subtotal	7.938	0.510		0.450		0.307		-		0.307	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	Multiple Activities : Not Specified	8.899	0.663	Oct 2017	0.585	Nov 2018	0.289	Nov 2019	-		0.289	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	10.459	0.663		0.585		0.289		-		0.289	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	10.858	0.673	Nov 2017	0.611	Nov 2018	0.334	Nov 2019	-		0.334	0.000	12.476	-
Miscellaneous	WR	NSWC, Activities : Not Specified	6.965	0.021	Nov 2017	0.019	Nov 2018	0.000	Nov 2019	-		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	17.836	0.694		0.630		0.334		-		0.334	0.000	19.494	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	113.915	5.093		4.357		2.533		-		2.533	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

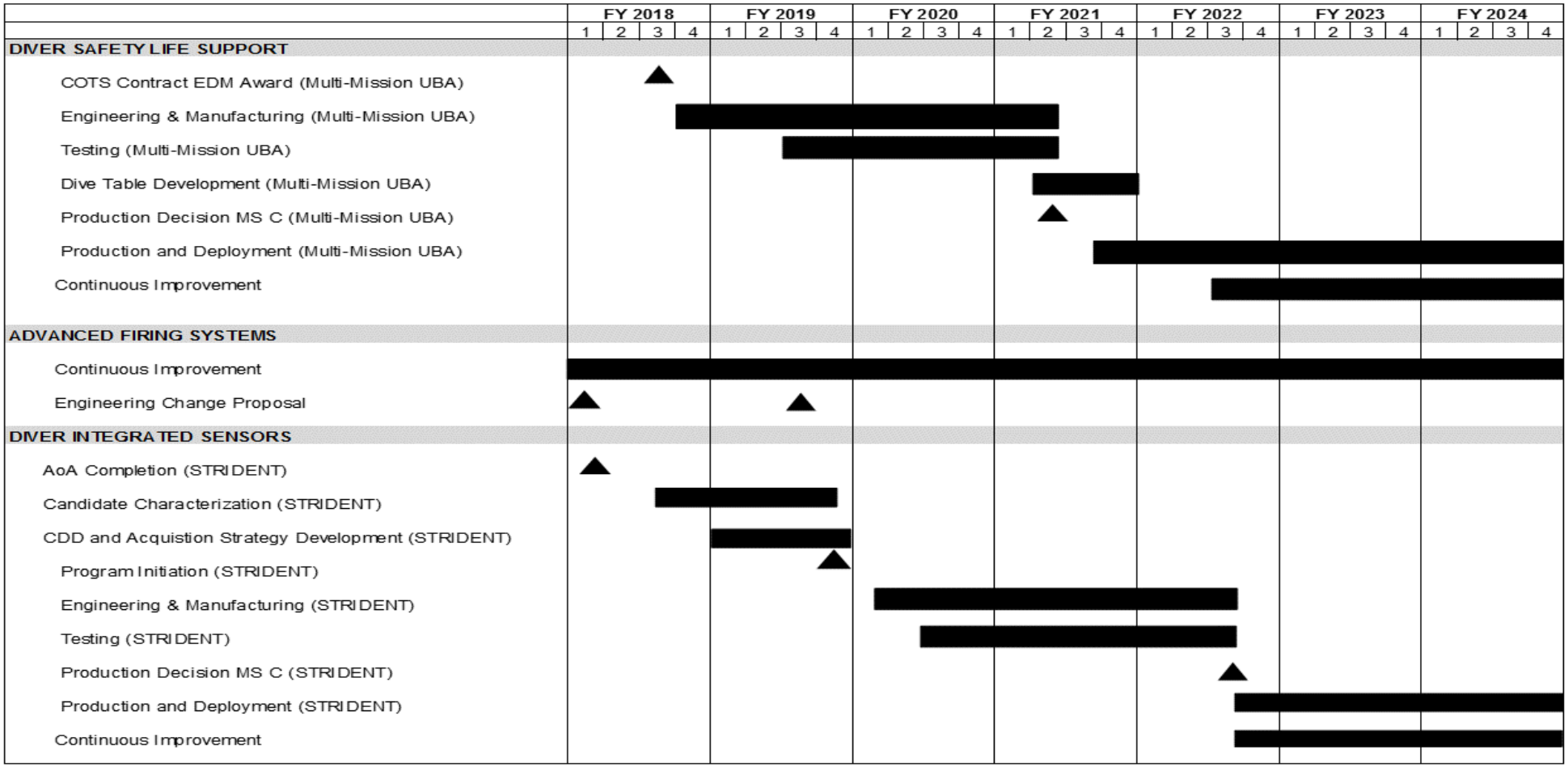

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1317				
TITLE: DIVER SAFETY LIFE SUPPORT	1	2018	4	2024
---COTS Contract EDM Award (Multi-Mission UBA)	3	2018	3	2018
---Engineering & Manufacturing (Multi-Mission UBA)	4	2018	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
---Production and Deployment (Multi-Mission UBA)	4	2021	4	2024
---Continuous Improvement_	3	2022	4	2024
TITLE: ADVANCED FIRING SYSTEMS	1	2018	4	2024
---Continuous Improvement.	1	2018	4	2024
---Engineering Change Proposal 1	1	2018	1	2018
---Engineering Change Proposal 2	3	2019	3	2019
TITLE: ADVANCED INTEGRATED DIVER SENSORS	1	2018	4	2024
--AoA Completion (STRIDENT)	1	2018	1	2018
--Candidate Characterization (STRIDENT)	4	2018	4	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
---Production Decision MS C (STRIDENT)	3	2021	3	2021
---Production and Deployment (STRIDENT)	4	2022	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 1317 / *EOD Diving System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
---Continuous Improvement	4	2022	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3177: *Joint Counter Radio-Controlled IED Elec Warfare*	13.194	43.652	27.625	5.044	14.178	19.222	29.858	26.316	26.889	27.430	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

Also provides for the rapid development and testing of JCREW Counter-Unmanned Aerial System (C-UAS) for Joint Urgent Operational Need Statement (JUON) CC-0558. This includes the modification of JCREW hardware, software, threat loads, and advanced techniques to provide an Increment I C-UAS capability, integration into JCREW dismounted systems delivered off the LRIP contract, lab verification, and open air testing. Due to rapidly evolving threats team will develop and support additional software drops throughout year.

The JCREW system, Increment 1 Block 1 (I1B1) is the next generation of counter RCIED systems. This family of systems 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 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Joint Counter Radio-Controlled IED Elec Warfare	43.652	25.679	4.135	13.158	17.293
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; 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					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. ***FY 2019 Plans:*** Perform and complete Tech Refresh development, implementation and testing for Tech Insertion 2. Complete AoA for Tech Insertion 3. Continue development and testing of threat loads, software, and hardware and processing the associated ECPs in support C-UAS JUON CC-0558. $12.9M OCO funding supports Navy assigned requirement to provide C-UAS capability in response to JUON CC-0558. Sixty C-UAS systems have been fielded to date to provide a rapid response initial capability, with additional systems planned per the JUON. Enhanced performance will be required to maintain capability against the evolving UAS threat. These enhancements will require development and testing of hardware and software/ firmware upgrades, and integration of C-UAS capability on various platforms, to include small combatant craft, ships, and fixed site infrastructure. ***FY 2020 Base Plans:*** Begin and perform development, implementation and testing for Tech Insertion 3. Continue development and testing of threat loads, software, and hardware and processing the associated ECPs. ***FY 2020 OCO Plans:*** Perform Tech Refresh to develop improved C-UAS detect, identify, track, and defeat capabilities. Continue development and testing of threat loads, software, and hardware and processing the associated ECPs. Funding supports Navy assigned requirement to provide C-UAS capability in response to the emerging threat. 60 C-UAS systems have been fielded to date to provide a rapid response initial capability, with additional systems planned per the JUON. Enhanced performance will be required to maintain capability against the evolving UAS threat.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
These enhancements will require development and testing of hardware and software/firmware upgrades, and integration of C-UAS capability on various platforms, to include small combatant craft, ships, and fixed site infrastructure. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 decrease ($-8.386M) accounts for the Completion of Tech insertion 2 in FY19, and to initiate the development of Tech insertion 3 in FY2020.					
Title: EOD CREW ***Articles:*** ***FY 2019 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 2020 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 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change.	0.000 -	0.946 -	0.909 -	0.000 -	0.909 -
Title: HEMLOCK ***Articles:*** ***FY 2019 Plans:*** $1M FY19 OCO funds to 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 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:***	0.000 -	1.000 -	0.000 -	1.020 -	1.020 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 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 2019 to FY 2020 Increase/Decrease Statement:*** No significant change.					
Accomplishments/Planned Programs Subtotals	43.652	27.625	5.044	14.178	19.222

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/5509(b): *Explosive Ordnance Disposal Equip*	51.262	31.736	0.868	-	0.868	0.877	0.894	0.912	0.931	0.000	171.617

Remarks

PE 0604653N/JT Cntr Radio Controlled IED Elec War (JCREW) consolidated into PE 0603654N/JT Service Explosive Ordn Dev FY17 and out.

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; 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.

E. Performance Metrics

Full Rate Production contract awarded July 2017 to Northrop Grumman includes Engineering Support Services (ESS) for Tech Insertion. Tech Insertion 1 development complete; ECP to retrofit systems approved in FY2018. Additional ESS awarded in June 2018 to support development and integration of Tech insertion 2. Tech Insertion 2 development commenced in FY2018 based on outcome of Analysis of Alternatives. Initiated Market Research for Tech Insertion 3 technology candidates in FY2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	Northrup Grumman : San Diego, CA	1.929	8.615	Jun 2018	5.534	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Northrup Grumman : San Diego, CA	3.464	3.452	Jun 2018	2.553	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	C/CPFF	Northrup Grumman : San Diego, CA	0.964	6.495	Jun 2018	2.682	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
System Integration	C/CPFF	Northrup Grumman : San Diego, CA	0.964	1.952	Jun 2018	2.405	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
Primary Hardware Development	Various	TBD : TBD	0.000	0.000		0.000		0.828	Jan 2020	2.526	Jan 2020	3.354	0.000	3.354	-
Systems Engineering	Various	TBD : TBD	0.000	0.000		0.000		0.376	Jan 2020	1.348	Jan 2020	1.724	0.000	1.724	-
Software Development	Various	TBD : TBD	0.000	0.000		0.000		0.510	Jan 2020	1.204	Jan 2020	1.714	0.000	1.714	-
System Integration	Various	TBD : TBD	0.000	0.000		0.000		0.373	Jan 2020	1.152	Jan 2020	1.525	0.000	1.525	-
		Subtotal	7.321	20.514		13.174		2.087		6.230		8.317	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	FFRDC	JHU/APL, MITRE : Laurel, MD	0.592	4.504	Dec 2017	1.858	Nov 2018	0.394	Nov 2019	1.148	Nov 2019	1.542	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	2.242	7.179	Nov 2017	6.886	Nov 2018	1.252	Nov 2019	3.062	Nov 2019	4.314	Continuing	Continuing	Continuing
Program Management Support	WR	IHEODTD : Indian Head, MD	0.331	1.241	Nov 2017	0.645	Nov 2018	0.159	Nov 2019	0.477	Nov 2019	0.636	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	3.165	12.924		9.389		1.805		4.687		6.492	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWC : Various	1.208	5.458	Nov 2017	1.927	Nov 2018	0.381	Nov 2019	1.633	Nov 2019	2.014	Continuing	Continuing	Continuing
Test & Evaluation	MIPR	YPG : Yuma, Arizona	0.850	3.175	Nov 2017	2.606	Nov 2018	0.485	Nov 2019	1.241	Nov 2019	1.726	Continuing	Continuing	Continuing
		Subtotal	2.058	8.633		4.533		0.866		2.874		3.740	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Cydecor : Various	0.224	0.790	Dec 2017	0.000		0.121	Nov 2019	0.229	Nov 2019	0.350	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC : Various	0.426	0.791	Dec 2017	0.529	Nov 2018	0.165	Nov 2019	0.158	Nov 2019	0.323	Continuing	Continuing	Continuing
		Subtotal	0.650	1.581		0.529		0.286		0.387		0.673	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.194	43.652		27.625		5.044		14.178		19.222	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

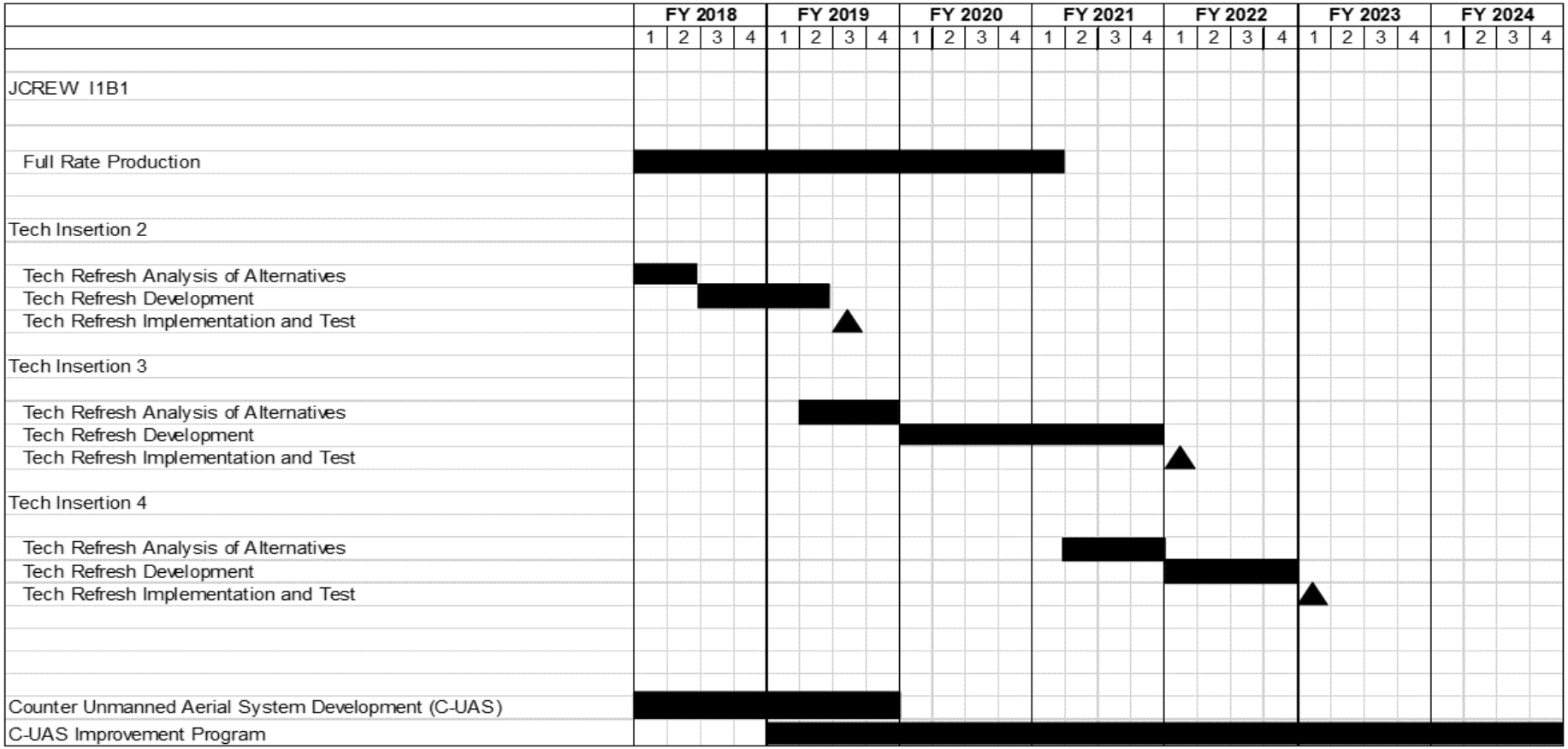

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

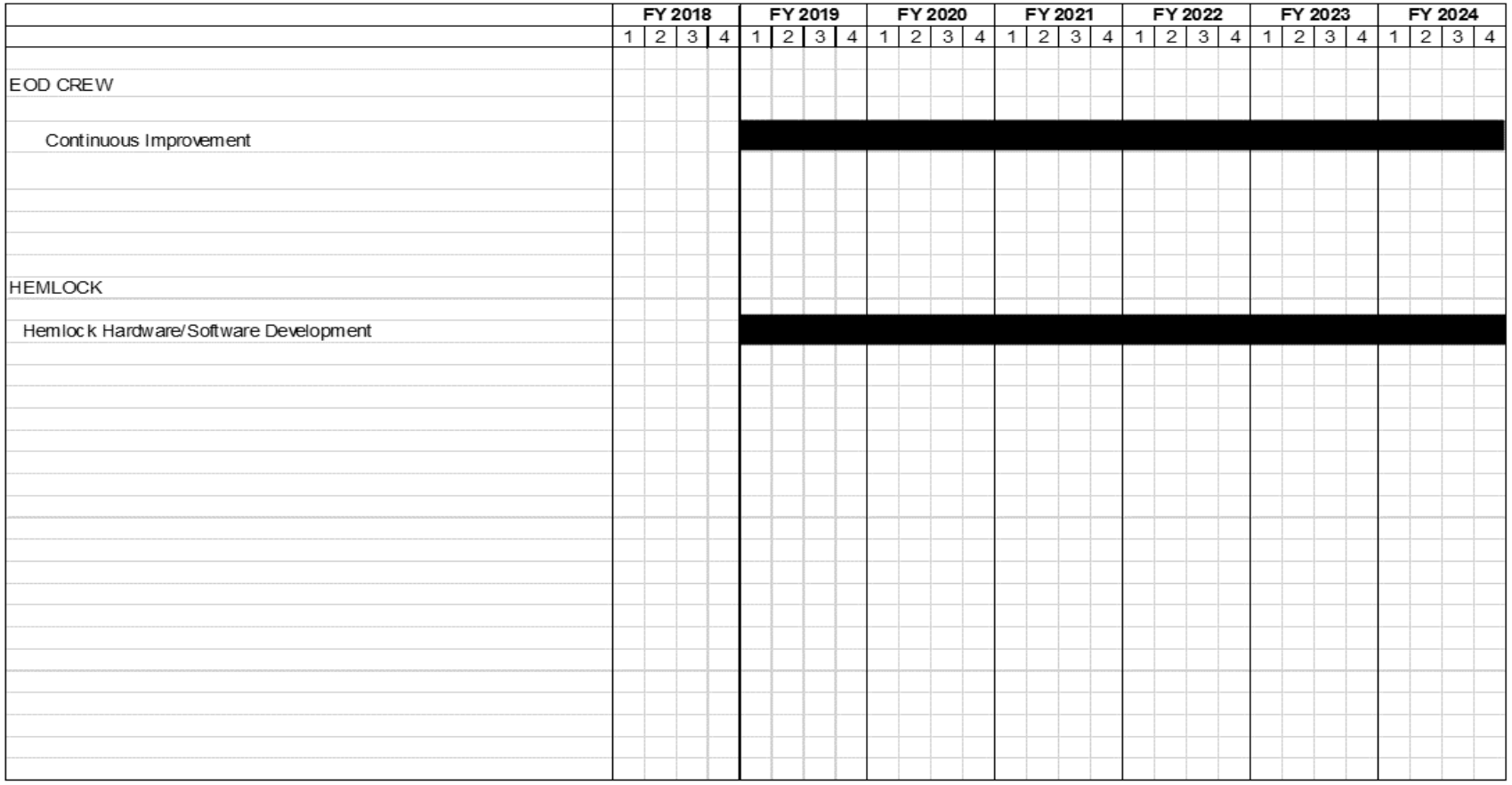

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 3177 / *Joint Counter Radio-Controlled IED Elec Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3177				
JCREW I1B1: Full Rate Production	1	2018	1	2021
JCREW I1B1: TECH INSERTION 2	1	2018	3	2019
JCREW I1B1: Tech Refresh Analysis of Alternatives (2)	1	2018	2	2018
JCREW I1B1: Tech Refresh Development (2)	3	2018	2	2019
JCREW I1B1: Tech Refresh Implementation and Test (2)	3	2019	3	2019
JCREW I1B1: TECH INSERTION 3	2	2019	2	2021
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	2018	4	2019
JCREW I1B1: C-UAS Improvement Program	1	2019	4	2020
EOD CREW: Continuous Improvement	1	2019	4	2024
EOD CREW: HEMLOCK	1	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*				Project (Number/Name) 4023 / *VSW MCM/Force Protection UUV*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
4023: *VSW MCM/Force Protection UUV*	125.302	15.618	16.936	16.121	-	16.121	16.227	15.682	18.217	18.580	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 EOD and MCM capability. Specifically, it provides for development of affordable expeditionary, unmanned underwater systems to support Navy Expeditionary forces including Explosive Ordnance Disposal (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 UXO including Underwater Improvised Explosive Devices. 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 MK18 Family of Systems acquisition programs as well as three major engineering change proposals and the enhancement to the MK18 Family of Systems to provide an underwater threat interdiction capability. These efforts require prototype development and significant RDT&E during FY20. Program execution tempo reflects continued efforts to support MK 18 UUV Increment II and EOD Response ROV capability development.

FY20 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 the MK18 Mod 2 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 other than the current 11 meter Rigid Hull Inflatable Boat (RHIB). These efforts will significantly improve the capabilities of the projected inventory of 16 MK 18 Mod 1 and 16 MK 18 Mod 2 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 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 Improvised Explosive Device).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: MK18 UUV Family of Systems	7.328	12.779	8.142	0.000	8.142
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 2019 Plans:*** FY19 efforts will focus on continued development and testing of MK 18 Mod 2 Increment II projects. Additionally, efforts to complete preliminary engineering change proposal actions necessary to transition technologies developed and demonstrated in the rapid innovation fund (RIF) and small business innovative research (SBIR) initiatives to initiate transition as incremental capability improvements to baseline MK 18 systems will continue. These capability improvements will form the developmental baseline for the Next Generation UUV system. ***FY 2020 Base 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 advanced technologies that will transition into the Increment II program of record during the engineering and manufacturing development phase. As each of these component technologies are tested and integrated into the system, the demonstrated capabilities will provide the means for warfighters to detect, classify and localize high priority threats in meeting mine warfare missions. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $4.637M from FY19 to FY20 is due to completion of the development and testing of UUV Advanced Sensor modules (SSAM and ATLAS) and initiation of the transition to Production & Deployment.					
Title: EOD Response ROVs and Maritime Expeditionary Standoff Response System of Systems	8.290	4.157	7.979	0.000	7.979
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					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 2019 Plans:*** FY19 efforts will focus on continued development and testing of MOTS ROV candidates to fill the existing capability gaps facing EOD forces in performing EOD response missions in assigned operational environments. FY19 efforts will also include initiation of the Maritime Expeditionary Standoff Response System of Systems (MESR SoS) defined by the approved MESR CDD. Each of these initiatives will provide enhanced capabilities for EOD forces in both contested and non-contested operational environments. ***FY 2020 Base Plans:*** FY20 will investigate and develop, test and evaluate enhancements to the selected MOTS ROV and will continue the development and testing of the first generation MESR systems. Component technologies will be integrated into three specific capability sets: Response Vehicle (RV) systems; standoff command and control modules; Task-Specialized Response Payloads. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $3.822M is due to the continued development and testing of enhancements to selected MOTS ROV to fill the existing capability gaps facing EOD forces and the initiation of the development and testing of candidate EOD					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Response ROV systems to provide a first generation Maritime Expeditionary EOD Response capability.					
Accomplishments/Planned Programs Subtotals	15.618	16.936	16.121	0.000	16.121

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/0977(a): *Underwater EOD Program (Cost Code UQ034)*	2.450	1.850	0.000	-	0.000	0.000	1.350	0.900	2.700	0.000	151.048
• OPN/0977(b): *Expeditionary Mine Countermeasures (ExMCM) (Cost Code UQ038)*	11.396	33.041	34.760	-	34.760	27.902	27.907	37.914	19.533	0.000	192.453
• OPN/0977 (c): *MK18 Unmanned Underwater Vehicle (MK UUV) (Cost Code UQ040)*	22.050	24.720	19.946	5.800	25.746	18.630	14.660	14.660	9.721	0.000	130.187

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 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-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

E. Performance Metrics

CNO approved requirements documents that define necessary Key Performance Parameters (KPPs) and additional system attributes will be used to verify and validate operational effectiveness and suitability through component and system level test and evaluation to locate, classify, identify, assess, neutralize and conduct post-neutralization battle damage assessment/verification of mines and unexploded ordnance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 4023 / *VSW MCM/Force Protection UUV*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activities : Not Specified	22.622	4.240	Oct 2017	3.588	Nov 2018	3.397	Nov 2019	-		3.397	0.000	33.847	-
Systems Engineering	WR	NSWC Activities : Not Specified	16.178	1.478	Oct 2017	2.613	Nov 2018	2.363	Nov 2019	-		2.363	0.000	22.632	-
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	24.345	1.652	Oct 2017	2.761	Nov 2018	2.524	Nov 2019	-		2.524	Continuing	Continuing	Continuing
		Subtotal	79.383	7.370		8.962		8.284		-		8.284	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	PERATON : Herndon, VA	6.262	0.572	Nov 2017	0.583	Nov 2018	0.528	Nov 2019	-		0.528	Continuing	Continuing	Continuing
		Subtotal	6.262	0.572		0.583		0.528		-		0.528	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation-WR	WR	NSWC Activities : Not Specified	16.971	3.844	Oct 2017	3.681	Nov 2018	3.604	Nov 2019	-		3.604	0.000	28.100	-
Independent T&E	WR	NSWC Activities : Not Specified	4.311	1.785	Oct 2017	1.763	Nov 2018	1.784	Nov 2019	-		1.784	0.000	9.643	-
Developmental Test & Evaluation	WR	NSWC Activities : Not Specified	10.145	1.284	Oct 2017	1.269	Nov 2018	1.272	Nov 2019	-		1.272	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	32.851	6.913		6.713		6.660		-		6.660	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	4.485	0.511	Nov 2017	0.520	Nov 2018	0.528	Nov 2019	-		0.528	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC Activities : Not Specified	2.303	0.252	Nov 2017	0.158	Nov 2018	0.121	Nov 2019	-		0.121	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
		Subtotal	6.806	0.763		0.678		0.649		-		0.649	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	125.302	15.618		16.936		16.121		-		16.121	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

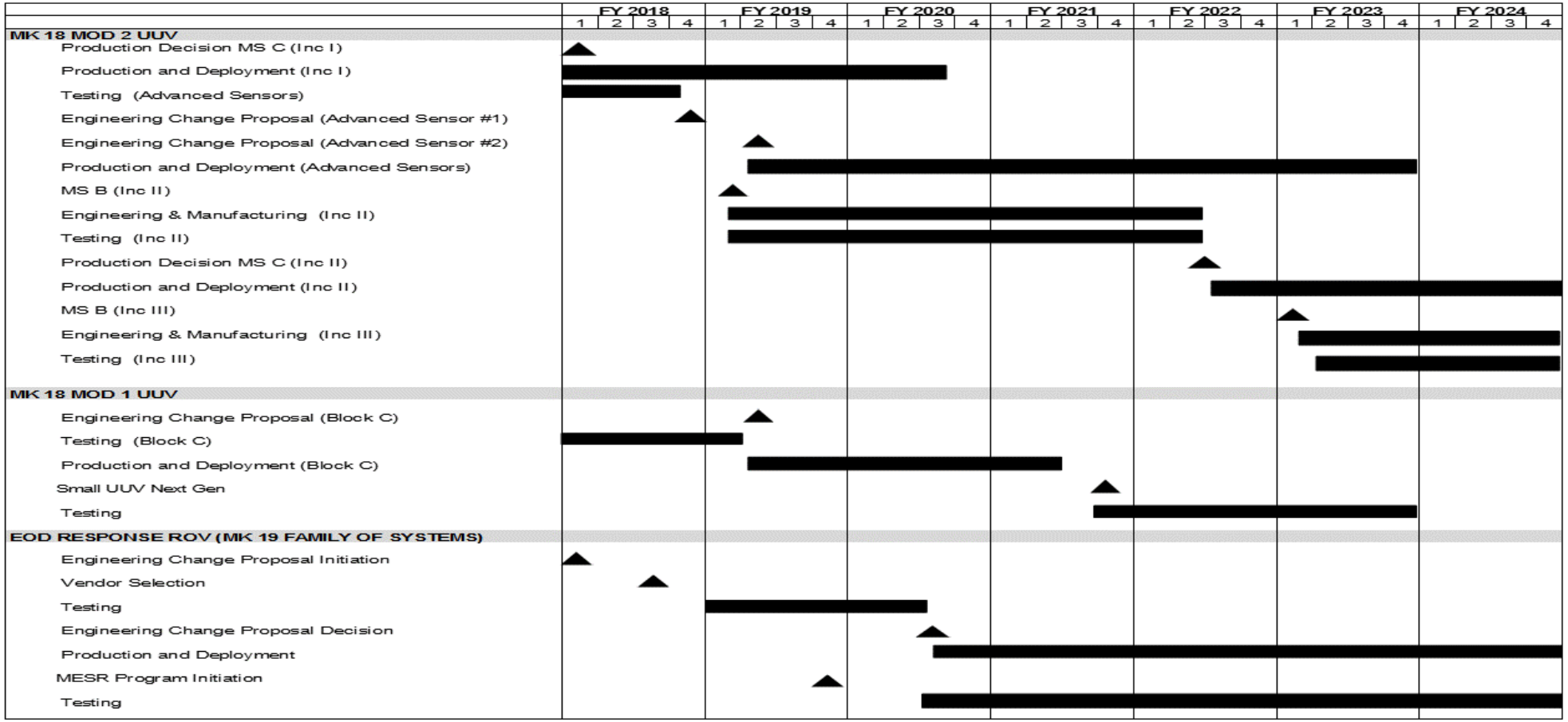

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4023				
TITLE: MK 18 MOD 2 UUV	1	2018	4	2024
---Production Decision MS C (Inc 1)	1	2018	1	2018
---Production and Deployment (Inc 1)	1	2018	3	2020
---Testing (Advanced Sensors)	1	2018	3	2018
---Engineering Change Proposal (Advanced Sensors #1)	4	2018	4	2018
---Engineering Change Proposal (Advanced Sensors #2)	2	2019	2	2019
---Production and Deployment (Advanced Sensors)	2	2019	4	2023
---MS B (Inc 2)	1	2019	1	2019
---Engineering & Manufacturing (Inc 2)	2	2019	2	2022
---Testing (Inc 2)	2	2019	2	2022
---Production Decision MS C (Inc 2)	2	2022	2	2022
---Production and Deployment (Inc 2)	3	2022	4	2024
---MS B (Inc III)	1	2023	1	2023
---Engineering & Manufacturing (Inc III)	2	2023	4	2024
---Testing (Inc III)	2	2023	4	2024
TITLE: MK 18 MOD 1 UUV	1	2018	4	2024
---Engineering Change Proposal (Block C)	2	2019	2	2019
---Testing (Block C)	1	2018	1	2019
---Production and Deployment (Block C)	2	2019	2	2021
---Small UUV Next Gen	4	2021	4	2021
---Testing (Block D)	4	2021	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 4023 / *VSW MCM/Force Protection UUV*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TITLE: EOD RESPONSE (ROV) (MK 19 FAMILY OF SYSTEMS)	1	2018	4	2024
---Engineering Change Proposal Initiation	1	2018	1	2018
---Vendor Selection	3	2018	3	2018
---Testing.	1	2019	2	2020
---Engineering Change Proposal Decision	3	2020	3	2020
---Production and Deployment	3	2020	4	2024
---MESR Program Initiation	4	2019	4	2019
---Testing	3	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
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 2018	FY 2019
Congressional Add: Breathing Apparatus for EOD Divers	0.000	5.000
FY 2018 Accomplishments: N/A		
FY 2019 Plans: 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.		
Congressional Adds Subtotals	0.000	5.000

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-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*

E. Performance Metrics

Performance metrics: Performance metrics vary depending upon specific capability developed aligned with specific missions. Reliability, Availability and Maintainability are primary metrics for life support systems. Metrics also include life support certification requirements mandated by NAVSEA SS521-AA-MAN-010.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / *JT Service Explosive Ordn Dev*	Project (Number/Name) 9999 / *Congressional Adds*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	PERATON : Herndon, VA	0.000	0.000		0.828	Nov 2018	0.000		-		0.000	0.000	0.828	-
		Subtotal	0.000	0.000		0.828		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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC : Panama City	0.000	0.000		3.996	Nov 2018	0.000		-		0.000	0.000	3.996	-
		Subtotal	0.000	0.000		3.996		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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NSWCIHEODTD : Indian Head, MD	0.000	0.000		0.100	Nov 2018	0.000		-		0.000	0.000	0.100	-
Miscellaneous	WR	NSWCIHEODTD : Indian Head, MD	0.000	0.000		0.076	Nov 2018	0.000		-		0.000	0.000	0.076	-
		Subtotal	0.000	0.000		0.176		0.000		-		0.000	0.000	0.176	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		5.000		0.000		-		0.000	0.000	5.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*

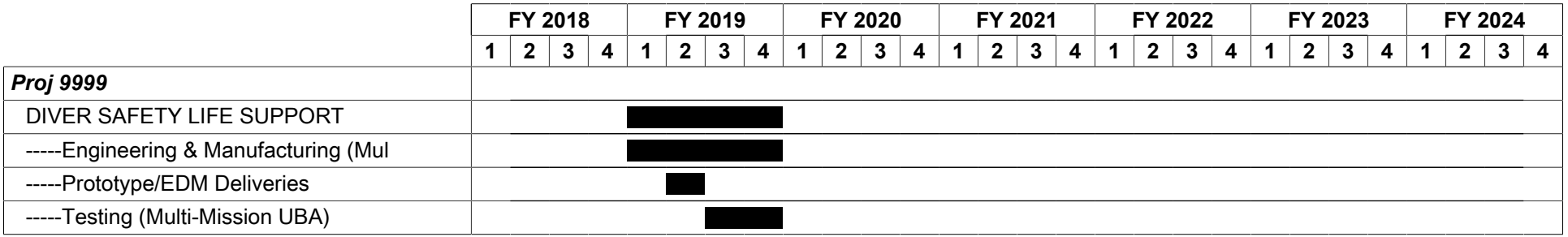

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603654N / *JT Service Explosive Ordn Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*

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