Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy											Date: May 2021	
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 0604127N *I Surface Mine Countermeasures*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	187.589	18.083	18.670	13.655	-	13.655	-	-	-	-	-	-
0530: *Mine Hunt Systems*	16.611	6.771	8.392	5.121	-	5.121	-	-	-	-	-	-
1233: *Surface MCM Mid-life Upgrade*	160.299	0.971	1.027	0.000	-	0.000	-	-	-	-	-	-
1235: *Mine Warfare Planning and Analysis*	10.679	10.341	9.251	8.534	-	8.534	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Surface Mine Countermeasures (SMCM) Program Element (PE) provides resources in support of development of mine countermeasures systems to provide minehunting and neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and neutralizing operations worldwide. Resources are for developing and deploying advanced minehunting and neutralization systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, reducing or eliminating post-mission analysis detect, classify, identify, decide time, improving neutralization time, improving network communications, automatic target recognition, and achieving in-stride detect-to-engage capability. The Surface Mine Countermeasures programs are in general platform independent and will provide detection, classification, localization, identification, neutralization, and influence clearance capabilities. Programs develop: (1) Unmanned minehunting capability for surface platforms; (2) the integration and improvement of new and existing systems (3) support for systems which detect, localize, classify, identify, and neutralize all mine types across MCM Avenger Class, Littoral Combat Ship (LCS) Class and other platforms.

1) The AN/AQS-20 is a minehunting and identification system with sensors housed in an underwater towed body. The sensors are designed for the detection, classification and localization of bottom, close-tethered, and volume targets, and also for the identification of bottom targets. The system will be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/AQS-20.

2) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFWB) is a technology upgrade to the AN/SQQ-32 Towed Body which incorporated HFWB technology into the detection sonar to address performance deficiencies against new mine threats in the littorals. This upgrade was installed on MCM-1 Class ships.

3) AN/SLQ-60 Mine Neutralization System (MNS) Seafox on the MCM Class ships. MNS is the replacement to the existing AN/SLQ-48 Mine Neutralization System.

4) AN/SSQ-94 MCM Trainer upgrade incorporates the AN/SQQ-32 (V)4 sonar, AN/SSN2(V)5 PINS and Mine Neutralization System Team Trainer.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 0604127N *I Surface Mine Countermeasures*

5) Mine Warfare and Environmental Decision Aids Library (MEDAL) is the U.S. Navy's single Mine Warfare (MIW) tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The most recent MEDAL increment, known as MEDAL Enterprise Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning. MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces.

MINEnet Global also supports dedicated MIW forces by providing downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations.

6) MIW Integrated Synthetic Trainer (MIST) will be a synthetic trainer which will provide integrated phase training for MIW staffs in end-to-end MCM scenarios. This tool will provide the capability to train the U.S. Navy's four MIW staffs against near peer threats. It will incorporate the laydown of simulated threat minefields expected to be used to blockade ports, defend against landing assaults, or deny access to sea lines of communication to control the training event. MIST began Q2 FY2020 after a FY2019 House Appropriations Committee (HAC) mark, and FY2020 Continuing Resolution Act (CRA).

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	18.735	18.754	15.010	-	15.010
Current President's Budget	18.083	18.670	13.655	-	13.655
Total Adjustments	-0.652	-0.084	-1.355	-	-1.355
• Congressional General Reductions	-	-0.084			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.652	0.000			
• Program Adjustments	0.000	0.000	-1.054	-	-1.054
• Rate/Misc Adjustments	0.000	0.000	-0.301	-	-0.301

Change Summary Explanation

Program Changes:

FY20: -$653K total; -$652K SBIR reduction; -$0.001 miscellaneous reduction

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 0604127N *I Surface Mine Countermeasures*

FY21: -84K miscellaneous reduction

FY22: -$1,355K total; -$1,054K program adjustment, -$301K misc rate adjustments

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 0530 / *Mine Hunt Systems*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
0530: *Mine Hunt Systems*	16.611	6.771	8.392	5.121	-	5.121	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mine Hunt Systems project contains resources for systems, subsystems, and sensors integrated for use with the Mine Countermeasures Unmanned Surface Vehicle (MCM USV) for mine detection, classification, localization, identification, neutralization, and influence sweep clearance capabilities. Research, development, test, and evaluation efforts are for increasing capability by decreasing time required to conduct Mine Countermeasures (MCM) operations, ensuring low risk to naval and commercial vessels, and removing the man from the minefield. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, and reducing post-mission analysis time for detection, classification, and identification.

The AN/AQS-20 is a minehunting and identification system with sensors housed in an underwater towed body. The sensors are designed for the detection, classification and localization of bottom, close-tethered, and volume targets, and also for the identification of bottom targets. The system will be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package (MP) or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/AQS-20. The AN/AQS-20 Block 1 (the AQS-20A) underwent a Pre-Planned Product Improvement (P3I) program to upgrade the Forward Looking Sonar (FLS) and Side Looking Sonars (SLS) to improve Probability of Classifying a Mine-like object as a Mine, reduce false classification, and improve depth localization performance to meet Block 2 (the AQS-20C) performance. The FLS is replaced with a new High Frequency Wideband Forward Looking Sonar (HFWBFLS) design. The SLS is replaced with a new multifunction SLS with Synthetic Aperture Sonar (SAS) capability, as well as improved signal processing and signal to noise ratio. The Block 1 P3I program began in FY 2012 and completed in FY 2017. Award and management for Block 2 production units began in FY 2014 (the AQS-20C). Materiel reliability, obsolescence, and performance Engineering Change Proposal (ECP) efforts continue beyond FY 2024.

In FY 2022, the AN/AQS-20 Block 2 Program will complete DT/OT with MCM USV, complete MCM USV IOT&E efforts, and help conduct the Mission Package (MP) IOT&E efforts. The program will continue development of ATR efforts and improve cybersecurity efforts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: AN/AQS-20 Product Development	2.100	3.251	2.517	0.000	2.517
Articles:	-	-	-	-	-
FY 2021 Plans: - Continue AN/AQS-20 Block 2 PMA improvements and NSAM integration - Transition SBIR Sonar Data Fusion of AQS-20 multi-sensor data to improve single pass detection - Initiate tech refresh to improve iPMA performance, to include data fusion and contact management tool					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Collect and classify high resolution SAS images from test data to support machine learning of image processing - Initiate development of super classification of mines by leveraging machine learning - Improvement of ATR by leveraging machine learning - Initiate development of a noise reduction algorithm to improve system performance by leveraging testing of the MCM USV - Initiate development of a Sound Velocity Profile (SVP) solution and integration of an active SVP profile update to improve system performance - Correct deficiencies identified during MCM USV developmental testing ***FY 2022 Base Plans:*** - Implement AN/AQS-20 Block 2 PMA improvements and NSAM integration based on MCM MP Tech Evaluation + MCM USV DT - Develop in-stride high resolution image to help improve identification requirement for AN/AQS-20 - Develop user tools to improve iPMA performance and user interface to improve Sailor performance - Continue development of super classification of mines by leveraging machine learning - Continue improvement of ATR by leveraging machine learning through mission data labeling and generating library - Initiate software modification to meet cyber security requirement ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to completion of MCM USV integration. FY 2022-planned effort is a reduction to support post-test & integration troubleshooting and modifications.					
Title: AN/AQS-20 Support	0.800	0.800	0.800	0.000	0.800
Articles:	-	-	-	-	-
FY 2021 Plans: - Provide ongoing technical and management support to AN/AQS-20 - Continue to conduct test minefield maintenance to support follow-on system improvements					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Continue AN/AQS-20 Block 2 Mission Planning and Post Mission Analysis MCM USV Concept of Employment development ***FY 2022 Base Plans:*** - Provide ongoing technical and management support to AN/AQS-20 product development - Continue to conduct test minefield maintenance to verify sonar performance through MCM USV DT and MCM MP IOT&E - Assess, score, and update AN/AQS-20 Block 2 tactics based on Mission Planning and Post Mission Analysis performance improvement from ATR and iPMA improvements - Provide engineer support to meet cyber security RMF process - Provide engineer support for FRP units modification and design upgrades due to obsolescence ***FY 2022 OCO Plans:*** N/A					
Title: AN/AQS-20 Test and Evaluation	3.370	3.879	1.612	0.000	1.612
Articles:	-	-	-	-	-
FY 2021 Plans: - Complete DT with the MCM USV - Initiate testing to characterize deep mining capability of AQS-20 - Initiate testing to characterize and model MCM USV Platform noise - Initiate testing and integration of Bi-Static EOID to transition the SBIR development program ***FY 2022 Base Plans:*** - Support MCM USV TECHEVAL & IOT&E - Support MCM MP TECHEVAL & IOT&E - Integration and test of Bi-Static EOID performance and validate against legacy sensor ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to completion of MCM USV DT and MCM MP TechEval.					
Title: AN/AQS-20 Management Services	0.501	0.462	0.192	0.000	0.192
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2021 Plans: - Provide planning and management for the AN/AQS-20 program - Continue to provide Program Office travel support - Continue support for sonar and iPMA technical refresh efforts - Continue risk reduction efforts ***FY 2022 Base Plans:*** - Provide planning and management for the AN/AQS-20 program. - Continue to provide Program Office travel support - Continue support for sonar and iPMA technical refresh efforts ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to reduced travel and transition to production efforts.					
Accomplishments/Planned Programs Subtotals	6.771	8.392	5.121	0.000	5.121

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPN/1601: *LCS MCM Mission Modules*	64.789	218.822	72.701	-	72.701	-	-	-	-	-	-

Remarks

OPN/1601 - The above funding line accounts for several programs, of which the Mine Hunt Systems program is only a portion.

D. Acquisition Strategy

AN/AQS-20 Low-Rate Initial Production (LRIP) procurement continued following the Block 2 (AQS-20C units) competitive contract award in FY 2014. In FY 2020, the AN/AQS-20 program leveraged the Unmanned Surface Vehicle (USV) Family of Systems (FoS) Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) to award multiple risk reduction efforts. The risk reduction efforts are planned to help increase competition for FY 2021 sonar production. The risk reduction effort will transition volume sonar capability and familiarize the industry to specific sonar requirement based on the finding from FY 2019 market research. In FY 2021, a sole-source AN/AQS-20A (Block 1) to AN/AQS-20C (Block 2) upgrade contract was awarded to Raytheon to continue delivering sonars to support integration and testing for the LCS MCM MP.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 0530 / *Mine Hunt Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Block 2 MCM USV Integration	C/CPFF	Raytheon : Portsmouth, RI	0.300	0.000		0.000		1.117	Nov 2021	-		1.117	-	-	-
AN/AQS-20 P3I	C/CPFF	Raytheon : Portsmouth, RI	1.608	1.800	Nov 2019	1.551	Nov 2020	0.315	Nov 2021	-		0.315	-	-	-
AN/AQS-20 P3I	C/CPFF	ARL/UT : Austin, TX	0.250	0.100	Dec 2019	1.000	Nov 2020	0.485	Nov 2021	-		0.485	-	-	-
AN/AQS-20 Block 2 PMA	WR	NSWC, PC : Panama City, FL	1.900	0.100	Oct 2019	0.100	Oct 2020	0.250	Oct 2021	-		0.250	-	-	-
AN/AQS-20 Block 2 PMA	C/CPFF	ARL/UT : Austin, TX	1.978	0.100	Dec 2019	0.100	Dec 2020	0.350	Dec 2021	-		0.350	-	-	-
AN/AQS-20 Risk Reduction	C/FFP	Various : Various	0.000	0.000		0.500	Dec 2020	0.000		-		0.000	-	-	-
		Subtotal	6.036	2.100		3.251		2.517		-		2.517	-	-	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Engineering Services	WR	NUWC/NPT : Newport, RI	0.365	0.000		0.000		0.000		-		0.000	-	-	-
AN/AQS-20 Engineering Services	WR	NSWC, PC : Panama City, FL	0.221	0.140	Oct 2019	0.140	Oct 2020	0.140	Oct 2021	-		0.140	-	-	-
AN/AQS-20 Engineering Services	C/CPFF	Raytheon : Portsmouth, RI	0.351	0.200	Nov 2019	0.200	Nov 2020	0.200	Nov 2021	-		0.200	-	-	-
AN/AQS-20 ILS Function	WR	NSWC, PC : Panama City, FL	0.716	0.460	Nov 2019	0.460	Nov 2020	0.460	Nov 2021	-		0.460	-	-	-
		Subtotal	1.653	0.800		0.800		0.800		-		0.800	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 T&E Functions	WR	COTF : Norfolk, VA	0.375	0.200	Nov 2019	0.200	Nov 2020	0.358	Nov 2021	-		0.358	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 T&E Functions	WR	NSWC, PC : Panama City, FL	6.547	2.660	Oct 2019	3.169	Oct 2020	0.759	Oct 2021	-		0.759	-	-	-
AN/AQS-20 T&E Functions	C/CPFF	Raytheon : Portsmouth, RI	1.000	0.510	Nov 2019	0.510	Nov 2020	0.495	Nov 2021	-		0.495	-	-	-
		Subtotal	7.922	3.370		3.879		1.612		-		1.612	-	-	N/A

Remarks

COTF - Commander Operational Test and Evaluation Force

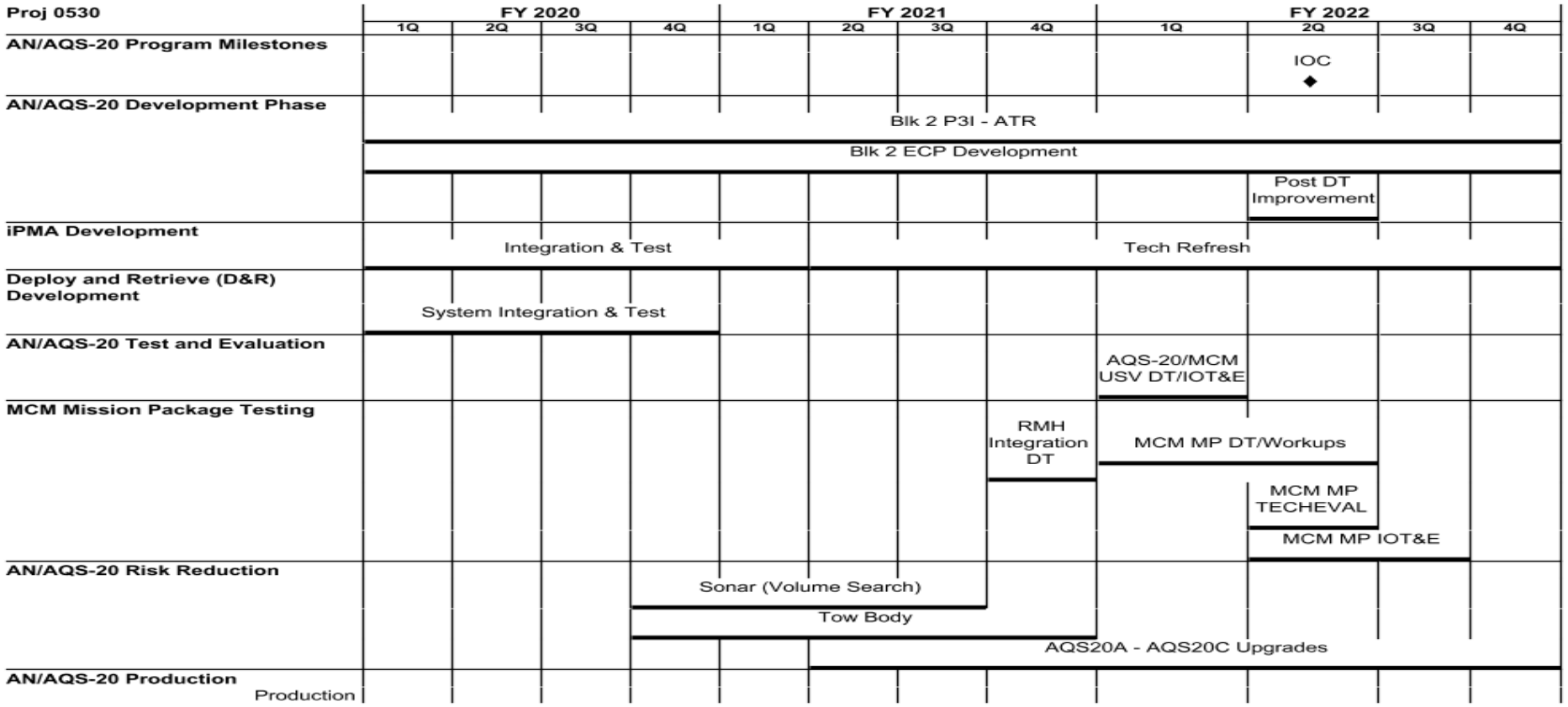
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Management Services	TBD	Various : Various	0.940	0.470	Dec 2019	0.432	Dec 2020	0.172	Dec 2021	-		0.172	-	-	-
AN/AQS-20 Travel	TBD	Various : Various	0.060	0.031	Mar 2020	0.030	Mar 2021	0.020	Mar 2022	-		0.020	-	-	-
		Subtotal	1.000	0.501		0.462		0.192		-		0.192	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.611	6.771		8.392		5.121		-		5.121	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*



2022PB - 0604127N - 0530

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 0530 / *Mine Hunt Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0530				
AN/AQS-20 Program Milestones: Initial Operational Capability (IOC)	2	2022	2	2022
AN/AQS-20 Development Phase: AN/AQS-20 Block 2 P3I - Automatic Target Recognition (ATR)	1	2020	4	2022
AN/AQS-20 Development Phase: AN/AQS-20 Materiel Reliability, Obsolesence, and Performance ECP Development (Block 2)	1	2020	4	2022
AN/AQS-20 Development Phase: AQS-20/MCM USV Post DT Improvement	2	2022	2	2022
iPMA Development: iPMA/NSAM Integration and Test	1	2020	1	2021
iPMA Development: iPMA Tech Refresh	2	2021	4	2022
Deploy and Retrieve (D&R) Development: System Integration and Test	1	2020	4	2020
AN/AQS-20 Test and Evaluation: AN/AQS-20/MCM USV DT/IOT&E	1	2022	1	2022
MCM Mission Package Testing: RMH MM/LCS Integration DT (DT-B10 Phase 3)	4	2021	4	2021
MCM Mission Package Testing: MCM MP Developmental Testing/Workups	1	2022	2	2022
MCM Mission Package Testing: MCM MP Tech Eval	2	2022	2	2022
MCM Mission Package Testing: MCM MP IOT&E	2	2022	3	2022
AN/AQS-20 Risk Reduction: Risk Reduction Sonar (Volume Search)	4	2020	3	2021
AN/AQS-20 Risk Reduction: Risk Reduction Tow Body	4	2020	4	2021
AN/AQS-20 Risk Reduction: AQS20A - AQS20C Upgrades	2	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 1233 / *Surface MCM Mid-life Upgrade*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
1233: *Surface MCM Mid-life Upgrade*	160.299	0.971	1.027	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface MCM Mid-life Upgrade project provides resources for development, improvement and integration of AN/SSQ-94 MCM Trainer. Trainer upgrade will incorporate the AN/ SQQ-32 (V)4 sonar, AN/SSN2(V)5 PINS and Mine Neutralization System Team Trainer.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Product Development	0.971	1.027	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: AN/SSQ-94 MCM Trainer Development					
FY 2021 Plans: Integration of MEDAL planning into the AN/SSQ-94 MCM Trainer.					
FY 2022 Base Plans: N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Reduction to zero based on planned completion of system upgrade in FY21.					
Accomplishments/Planned Programs Subtotals	0.971	1.027	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

AN/SSQ-94 - Naval Surface Warfare Center, Panama City (NSWC, PC) and ARL UT designed and developed the SSQ-94 MCM Trainer.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1233 / *Surface MCM Mid-life Upgrade*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MNS Development	Various	TBD : TBD	22.455	0.000		0.000		0.000		-		0.000	-	-	-
SSQ-94 Trainer	WR	NSWC, PC : NSWC, PC	16.344	0.971	Dec 2019	1.027	Dec 2020	0.000		-		0.000	-	-	-
BSP: Develop Bottom Sediment Classifier	WR	NRL : WASHINGTON, DC	0.258	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering and Integration	WR	NSWC, PC : PANAMA CITY, FL	0.306	0.000		0.000		0.000		-		0.000	-	-	-
System Development 1	WR	NSWC, PC : SAN DIEGO, CA	0.373	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering 2	WR	NSWC, PC : PANAMA CITY, FL	2.915	0.000		0.000		0.000		-		0.000	-	-	-
Systems Engineering 3 MCM CES	WR	NSWC, PC : PANAMA CITY, FL	1.633	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Primary Hardware Development 1	C/CPAF	ARL UT : TEXAS	15.511	0.000		0.000		0.000		-		0.000	-	-	-
Primary Hardware Development 2	WR	ARL-UT : AUSTIN, TX	0.000	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Tow Cable Development	C/CPAF	ARL UT : TEXAS	1.399	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Ship Integration	WR	NSWC, PC : PANAMA CITY, FL	1.697	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: SYSTEM ENGINEER	C/CPAF	ARL UT : TEXAS	9.065	0.000		0.000		0.000		-		0.000	-	-	-
Software Development MEDAL EA	C/CPFF	SAIC : McLean, VA	41.180	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	113.136	0.971		1.027		0.000		-		0.000	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 1233 / *Surface MCM Mid-life Upgrade*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop Logistics Products	WR	NSWC, PC : PANAMA CITY, FL	0.243	0.000		0.000		0.000		-		0.000	-	-	-
Software Development 1	C/CPFF	SAIC : McLean, VA	0.350	0.000		0.000		0.000		-		0.000	-	-	-
Software Development 2	C/CPFF	SAIC : McLean, Va	0.914	0.000		0.000		0.000		-		0.000	-	-	-
HFWB Software Development	C/CPAF	ARL-UT : TEXAS	8.450	0.000		0.000		0.000		-		0.000	-	-	-
HFWB Integrated Logistics Support	WR	NSWC, PC : PANAMA CITY, FL	2.765	0.000		0.000		0.000		-		0.000	-	-	-
Software Engineering 1 MCM CES	WR	NSWC, PC : PANAMA CITY, FL	1.517	0.000		0.000		0.000		-		0.000	-	-	-
Software Engineering 2 MEDAL	WR	NSWC, PC : PANAMA CITY, FL	2.458	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	16.697	0.000		0.000		0.000		-		0.000	-	-	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL Test and Evaluation	C/FP	SAIC : McLean, VA	7.636	0.000		0.000		0.000		-		0.000	-	-	-
MCM CES Test and Evaluation 1	C/CPAF	VARIOUS : VARIOUS	1.782	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Developmental Test and Evaluation	C/CPAF	ARL-UT : TEXAS	5.925	0.000		0.000		0.000		-		0.000	-	-	-
Test and Evaluation 2	C/CPAF	VARIOUS : VARIOUS	5.204	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	20.547	0.000		0.000		0.000		-		0.000	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 1233 / *Surface MCM Mid-life Upgrade*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support 1	C/CPFF	CACI : WASHINGTON, DC	0.263	0.000		0.000		0.000		-		0.000	-	-	-
Travel 1	WR	NAVSEA : WNY, DC	0.084	0.000		0.000		0.000		-		0.000	-	-	-
Government Engineering Support1	WR	NSWC, PC : PANAMA CITY, FL	0.325	0.000		0.000		0.000		-		0.000	-	-	-
MEDAL Program Management Support 2	Various	VARIOUS : VARIOUS	2.827	0.000		0.000		0.000		-		0.000	-	-	-
SBIR Assessment 2	Various	VARIOUS : VARIOUS	0.019	0.000		0.000		0.000		-		0.000	-	-	-
Program Management Support 3	C/CPFF	CACI : WASHINGTON, DC	1.341	0.000		0.000		0.000		-		0.000	-	-	-
Program Management Support 4	C/CPFF	CACI : WASHINGTON, DC	0.080	0.000		0.000		0.000		-		0.000	-	-	-
Government Engineering Support3	WR	NSWC, PC : PANAMA CITY, FL	0.090	0.000		0.000		0.000		-		0.000	-	-	-
Travel 3	C/CPAF	NAVSEA : WNY, DC	0.256	0.000		0.000		0.000		-		0.000	-	-	-
Program Management Support 5	C/CPFF	CACI : WASHINGTON, DC	0.167	0.000		0.000		0.000		-		0.000	-	-	-
Government Engineering Support4	WR	NSWC, PC : PANAMA CITY, FL	0.010	0.000		0.000		0.000		-		0.000	-	-	-
Travel4	C/CPAF	NSWC, PC : PANAMA CITY, FL	0.069	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Program Management Support 6	C/CPAF	VARIOUS : VARIOUS	1.442	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Government Engineering Support5	WR	NSWC, PC : PANAMA CITY, FL	0.750	0.000		0.000		0.000		-		0.000	-	-	-
HFWB: Travel 5	C/CPAF	NAVSEA : WNY, DC	0.080	0.000		0.000		0.000		-		0.000	-	-	-
Government Engineering Support6	WR	NSWC, PC : PANAMA CITY, FL	1.352	0.000		0.000		0.000		-		0.000	-	-	-
Travel 6	C/CPAF	NAVSEA : WNY, DC	0.238	0.000		0.000		0.000		-		0.000	-	-	-
SBIR Assessment 6	Various	VARIOUS : VARIOUS	0.054	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 1233 / *Surface MCM Mid-life Upgrade*	

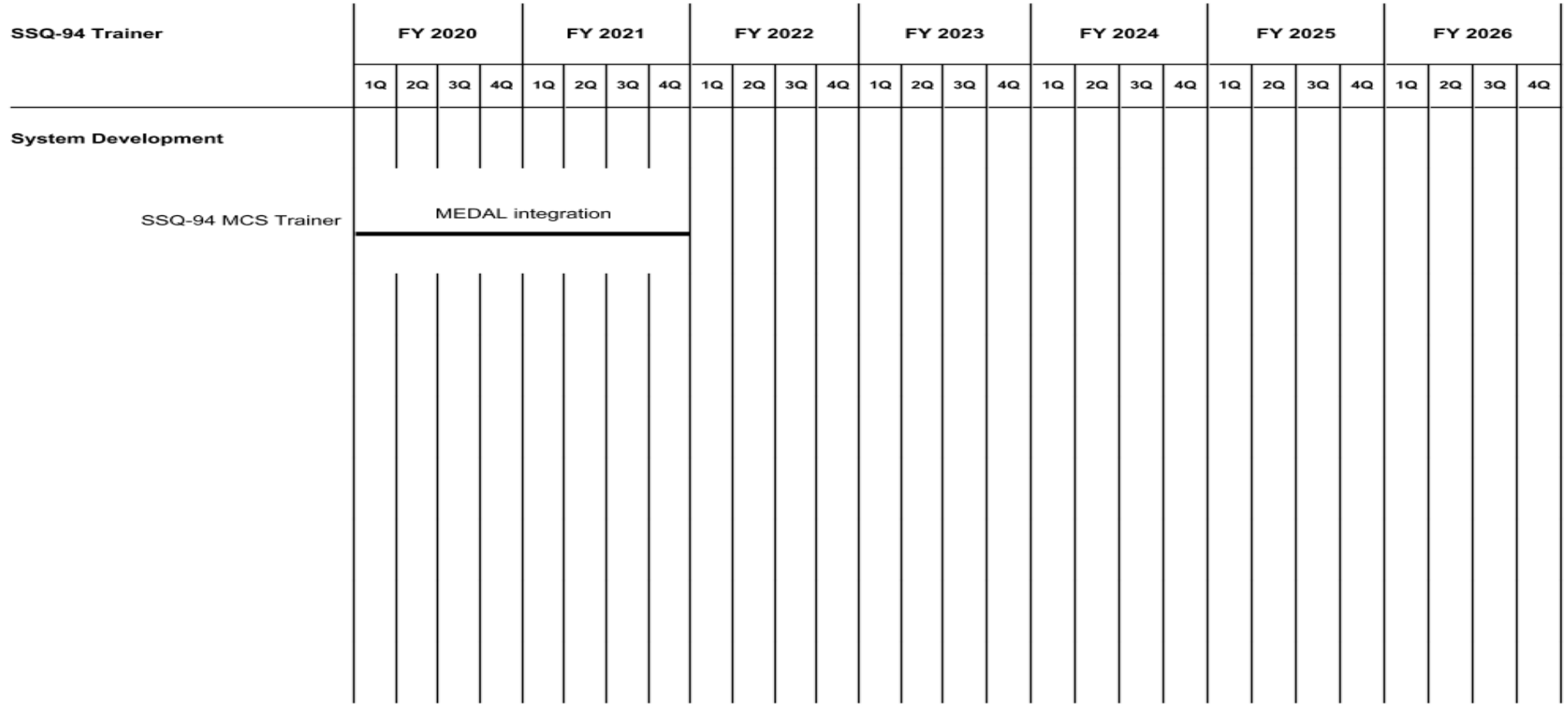
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support 7	C/CPAF	VARIOUS : VARIOUS	0.350	0.000		0.000		0.000		-		0.000	-	-	-
Acquisition Workforce Fund	Various	VARIOUS : VARIOUS	0.122	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	9.919	0.000		0.000		0.000		-		0.000	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	160.299	0.971		1.027		0.000		-		0.000	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1233 / *Surface MCM Mid-life Upgrade*



2022DON - 0604127N - 1233

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1233 / *Surface MCM Mid-life Upgrade*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSQ-94 Trainer				
System Development: SSQ-94 MCS Trainer: SSQ-94 MCS Trainer Development	1	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*				Project (Number/Name) 1235 / *Mine Warfare Planning and Analysis*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
1235: *Mine Warfare Planning and Analysis*	10.679	10.341	9.251	8.534	-	8.534	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY2022 funding request was reduced by $0.075 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Mine Warfare Planning and Analysis project consists of two projects, the Mine Warfare and Environmental Decision Aids Library (MEDAL) and the Mine Warfare (MIW) Synthetic Trainer (MIST).

MEDAL is the U.S. Navy's single MIW tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The most recent MEDAL increment, known as MEDAL Enterprise Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning.

MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces. MINEnet Global also supports dedicated MIW forces by providing downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations.

MIST will be a synthetic trainer which will provide integrated phase training for MIW staffs in end-to-end MCM scenarios. This tool will provide the capability to train the U.S. Navy's four MIW staffs against near peer threats. It will incorporate the laydown of simulated threat minefields expected to be used to blockade ports, defend against landing assaults, or deny access to sea lines of communication to control the training event. MIST began in FY2020 after a FY2019 House Appropriations Committee (HAC) mark, and FY2020 Continuing Resolution Act (CRA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Product Development	3.769	3.445	3.172	0.000	3.172
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY 2021 Plans: In FY2021 the MEDAL program will complete MINEnet Tactical (MNT) updates to address issues identified in the MEDAL Mine Countermeasures (MCM) Commander's Estimate of the Situation (CES) capability, complete MNT v1.3.3 updates to address bugs prior to the MCM Mission Package initial operational test and evaluation event and continue MNT v1.4 development. MNT v1.4 is a multi-year effort to replace commercial-off-the-shelf (COTS) components, which are either near end-of-life or no longer approved in Department of the Navy (DoN) Application and Database Management System (DADMS), with new, approved components in order to maintain cybersecurity compliance. The effort will include updates to the MINEnet Global application. Complete MEDAL Tactical Performance Database (TPDB) updates for AN/AQS-24C final performance values, and UISS and AN/AQS-20C initial performance values. MEDAL will also begin TPDB updates for Knifefish, UISS, and AN/AQS-20C final performance values. The MEDAL program will continue Minefield Planning v1.1 software development. In FY2021 MIST will complete build v0.1 development to demonstrate data transfer between MIST and MINEnet Tactical (MNT), and deliver build v0.1 prototype. Build v0.1 prototype will simulate unit-level Mine Countermeasure (MCM) operations while interfacing with MNT. MIST will start build v0.2 development to import, validate, and generate Naval Mine Warfare (NMW) messages containing synthetic contact and effort data.					
FY 2022 Base Plans: In FY2022, continue MINEnet Tactical (MNT) v1.4 development, and complete TPDB updates for Knifefish, UISS, and AN/AQS-20C final performance values. Final performance values will be validated for Fleet release. The MEDAL program will complete Minefield Planning v1.1 software development. In FY2022 MIST will complete build v0.2 development and deliver build v0.2 prototype. Build v0.2 prototype will simulate NMW message communication between Mine Countermeasures (MCM) Commanders (MCMCs) and subordinate MCM Units. MIST will start build v0.3 development to build, initiate, inject operational mission variables into, and provide debrief information for a training scenario.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY2022 funding decrease reduces the MIST software development effort from four full-time equivalent (FTE) to three and slows MIST build v0.2 development.					
Title: Engineering Support	5.716	4.875	4.437	0.000	4.437
Articles:	-	-	-	-	-
FY 2021 Plans: Provide systems engineering technical management and execute necessary integrated logistics support and training tasks across the MEDAL EA family of systems, to support the lifecycle of the project. Conduct system functional review for MEDAL EA. Continue systems engineering technical management for MEDAL EA MINEnet Tactical (MNT) v1.4 development, assess critical issues and manage process to incorporate fixes. Conduct requirements analysis, prepare engineering change proposals and conduct configuration management for Minefield Planning v1.1 software update. Conduct requirements analysis of overall MEDAL backlog, allocate requirements to future builds. Continue maintenance of integrated logistics and training documents and processes such as life-cycle sustainment plan, Navy training systems plan, demilitarization plan, maintenance plan, and obsolescence plan to support integrated logistics support certification and to ensure fielded systems are supported. Continue cybersecurity patching and monthly assessments. Execute system upgrades to fielded systems to ensure cybersecurity compliance. Start documentation development to support Milestone B decision. Perform MIST requirements analysis, draft software functional and software requirements specification to inform System Requirements Review/System Functional Review (SRR/SFR), and conduct the SRR/SFR. MIST will begin initial Tactics scenario and curriculum development, as well as continue cybersecurity requirements analysis and implementation.					
FY 2022 Base Plans: Continue systems engineering technical management for MEDAL EA MNT v1.4 development, assess critical issues and manage process to incorporate fixes. Begin requirements analysis for MNT v1.5. Finalize documentation required for Milestone B. Conduct requirements analysis of overall MEDAL backlog, allocate requirements to future builds. Provide technical integration of developed algorithms and models that have demonstrated the required level of maturity for transition. Continue maintenance of integrated logistics and training documents and processes to support integrated logistics support certification and to ensure fielded systems are supported. Continue Cybersecurity patching and assessments. Execute system upgrades to fielded systems to ensure cybersecurity compliance.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
In FY2022, MIST will continue tactics scenario and curriculum development, cybersecurity requirements, design analysis, and continue training curriculum development. Conduct build v0.2 release review. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY2021 required more engineering support than FY2022 because MIST SRR and SFR were conducted in FY2021.					
Title: Test and Evaluation	0.259	0.362	0.358	0.000	0.358
Articles:	-	-	-	-	-
FY 2021 Plans: Continue annual integration testing activities for multiple platforms including LCS MCM MPAS, ISNS, CANES, ONENET, NMCI integration tests. Conduct MNT v1.3.2 engineering test; conduct MNT v1.3.3 release candidate test; begin preparing for MFP v1.1 release candidate test, which will begin Q1FY2022. Conduct MIST build v0.1 prototype assessment. ***FY 2022 Base Plans:*** Conduct MFP v1.1 Release Candidate Testing. Continue annual integration testing activities for multiple platforms including LCS MCM MPAS, ISNS, CANES, ONENET, NMCI integration tests. Conduct MIST build v0.2 prototype assessment. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No significant change in Test and Evaluation scope.					
Title: Management Services	0.597	0.569	0.567	0.000	0.567
Articles:	-	-	-	-	-
FY 2021 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Continue to provide program management support and travel oversight for MEDAL program. Continue to plan, track, follow-up and report on cost, schedule and performance status. Oversight of financial and logistics efforts. Continue to prepare for Milestone B. Continue to plan, track, follow-up and report on cost, schedule and performance status of the MIST program. Oversight of financial and logistics efforts. ***FY 2022 Base Plans:*** Continue to provide program management support and travel oversight for MEDAL program. Continue to plan, track, follow-up and report on cost, schedule and performance status. Oversight of financial and logistics efforts. Conduct Milestone B and close-out actions following the Milestone B review. Continue to plan, track, follow-up and report on cost, schedule and performance status of the MIST program. Oversight of financial and logistics efforts. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No significant change in Management Services scope.					
Accomplishments/Planned Programs Subtotals	10.341	9.251	8.534	0.000	8.534

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 2622/LV075: *Mine Sweeping Replacement (MEDAL)*	0.000	0.005	0.349	-	0.349	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The MEDAL program is government led and executed. NSWC PCD is the lead government activity, and awarded a Seaport engineering services contract to Innovative Professional Solutions (IPS) in FY2020 to provide additional engineering capacity across disciplines.

MIST is a government product designed, developed and supported at NSWC PCD.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	SS/IDIQ	Various : Panama City FL	2.910	0.172	Oct 2019	0.000		0.000		-		0.000	-	-	-
MEDAL EA	C/IDDQ	IPS : Panma City, FL	0.000	0.171	Jun 2020	0.145	Oct 2020	0.145	Oct 2021	-		0.145	-	-	-
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PCD : Panama City FL	2.360	3.426	Oct 2019	3.300	Oct 2020	3.027	Oct 2021	-		3.027	-	-	-
		Subtotal	5.270	3.769		3.445		3.172		-		3.172	-	-	N/A

Remarks

FY 2017 and prior funding in Program Element (PE) 0603502N.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PC : Panama City FL	2.818	4.844	Oct 2019	4.194	Oct 2020	3.756	Oct 2021	-		3.756	-	-	-
MEDAL EA	C/IDDQ	IPS : Panama City FL	0.000	0.416	Jun 2020	0.681	Oct 2020	0.681	Oct 2021	-		0.681	-	-	-
MEDAL EA	SS/IDIQ	Various : Panama City FL	0.000	0.456	Oct 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	2.818	5.716		4.875		4.437		-		4.437	-	-	N/A

Remarks

FY 2017 and prior funding in Program Element (PE) 0603502N.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PCD : Panama City, FL	0.799	0.226	Oct 2019	0.329	Oct 2020	0.325	Oct 2021	-		0.325	-	-	-
MEDAL EA	C/IDDQ	IPS : Panama City, FL	0.496	0.000		0.033	Oct 2020	0.033	Oct 2021	-		0.033	-	-	-
MEDAL EA	SS/IDIQ	Various : Panama City, FL	0.000	0.033	Oct 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	1.295	0.259		0.362		0.358		-		0.358	-	-	N/A

Remarks

FY 2017 and prior funding in Program Element (PE) 0603502N.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PC : Panama City Fl	1.296	0.294	Oct 2019	0.296	Oct 2020	0.294	Oct 2021	-		0.294	-	-	-
MEDAL EA	WR	NUWC NPT : Newport, RI	0.000	0.030	Oct 2019	0.000		0.000		-		0.000	-	-	-
MEDAL EA	C/IDDQ	IPS : Panama City, FL	0.000	0.000		0.273	Oct 2020	0.273	Oct 2021	-		0.273	-	-	-
MEDAL EA	SS/IDIQ	Various : Panama City, FL	0.000	0.273	Oct 2019	0.000		0.000		-		0.000	-	-	-
		Subtotal	1.296	0.597		0.569		0.567		-		0.567	-	-	N/A

Remarks

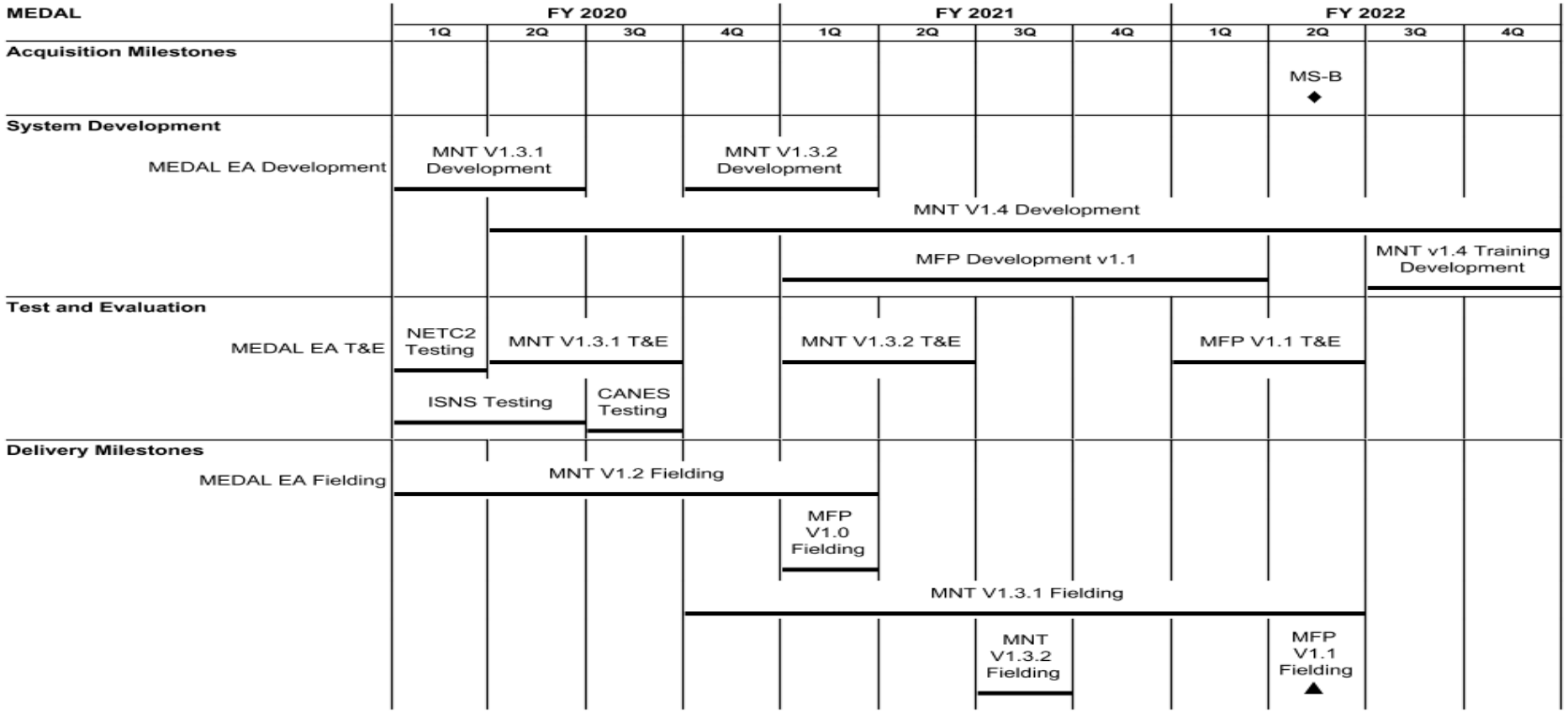
FY 2017 and prior funding in Program Element (PE) 0603502N.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / *Surface Mine Countermeasures*	Project (Number/Name) 1235 / *Mine Warfare Planning and Analysis*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.679	10.341		9.251		8.534		-		8.534	-	-	N/A

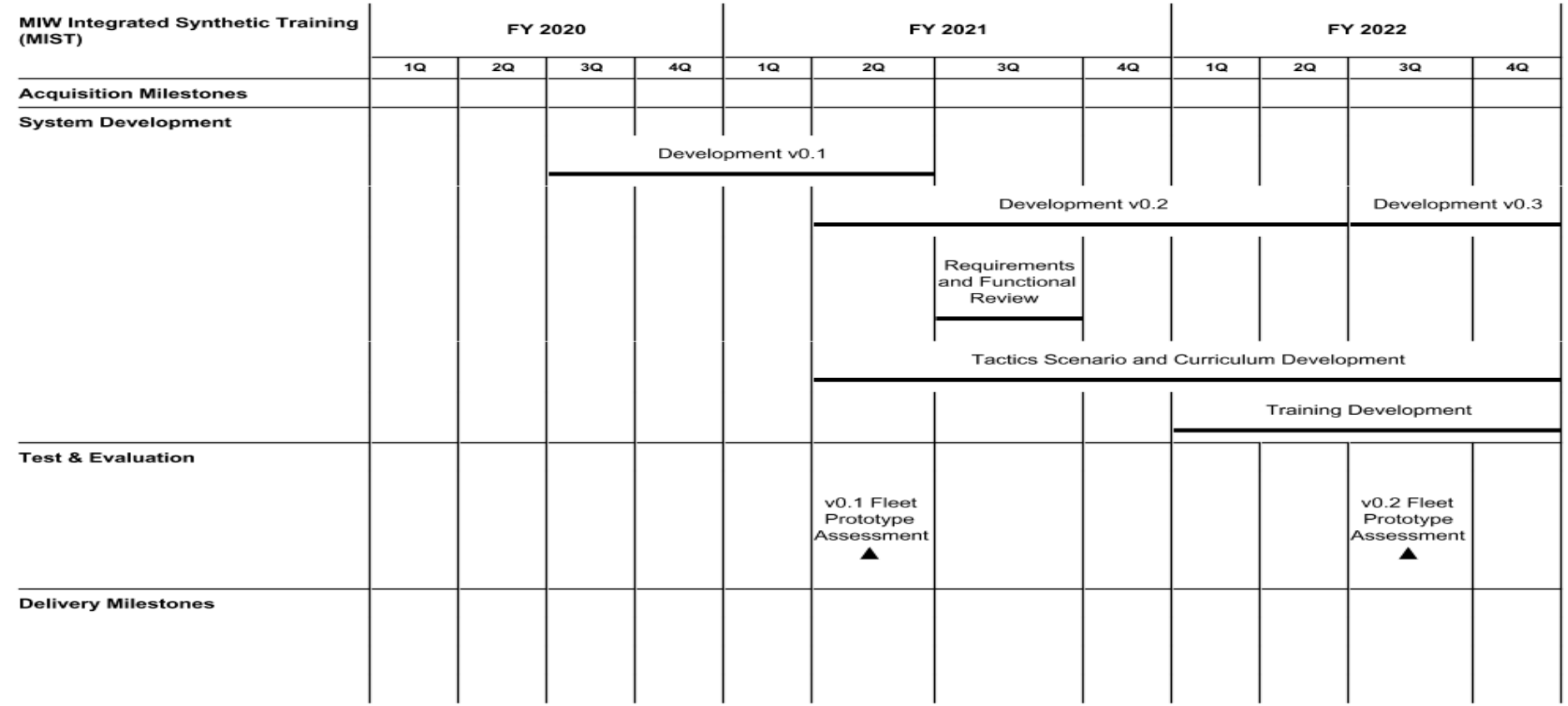
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*



2022PB - 0604127N - 1235

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*



2022PB - 0604127N - 1235

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MEDAL				
Acquisition Milestones: Milestone B	2	2022	2	2022
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical V1.3.1	1	2020	2	2020
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical V1.3.2	4	2020	1	2021
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical V1.3.3	2	2021	4	2021
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical V1.4	2	2020	4	2022
System Development: MEDAL EA Development: MEDAL EA Development: Minefield Planning v1.1 (MFP) Development	1	2021	1	2022
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.4 Training Development	3	2022	4	2022
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical V1.3.1	2	2020	3	2020
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical V1.3.2	1	2021	2	2021
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical V1.3.3	4	2021	4	2021
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MFP v1.1 Test & Evaluation	1	2022	2	2022
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical and NETC2 Integration Testing	1	2020	1	2020
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical and ISNS Integration Testing	1	2020	2	2020
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical and CANES Integration Testing 2	3	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604127N / *Surface Mine Countermeasures*	**Project (Number/Name)** 1235 / *Mine Warfare Planning and Analysis*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical V1.2 Fielding	1	2020	1	2021
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP V1.0 Fielding	1	2021	1	2021
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical V1.3.1 Fielding	4	2020	2	2022
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical V1.3.2 Engineering Release Fielding	3	2021	3	2021
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical V1.3.3 Fielding	1	2022	1	2022
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP V1.1 Fielding	2	2022	2	2022
MIW Integrated Synthetic Training (MIST)				
System Development: MIST Development: Development v0.1	3	2020	2	2021
System Development: MIST Development: Development v0.2	2	2021	2	2022
System Development: MIST Development: Development v0.3	3	2022	4	2022
System Development: MIST Development: Requirements and Functional Review	3	2021	3	2021
System Development: MIST Development: Tactics Scenario and Curriculum Development	2	2021	4	2022
System Development: MIST Development: Training Development	1	2022	4	2022
Test & Evaluation: MIST T&E: v0.1 Fleet Prototype Assessment	2	2021	2	2021
Test & Evaluation: MIST T&E: v0.2 Fleet Prototype Assessment	3	2022	3	2022