Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy											Date: March 2023	
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 0603502N *I Surface & Shallow Water MCM*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	283.267	51.637	87.746	34.690	-	34.690	25.998	26.294	27.374	27.975	Continuing	Continuing
1234: *Unmanned Surface Vehicle (USV)*	179.895	19.637	24.887	14.463	-	14.463	16.898	19.481	19.041	19.371	Continuing	Continuing
2989: *Barracuda*	103.372	32.000	62.859	20.227	-	20.227	9.100	6.813	8.333	8.604	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources for development of unmanned mine countermeasures systems to provide minehunting, minesweeping, and mine neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land-based or sea-based minehunting and minesweeping operations worldwide. Resources are for developing and deploying advanced minehunting and minesweeping 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. Core capabilities include forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance and disaster response to maintain freedom of the seas. 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. Concept of operations includes development of cooperative, unmanned, modular systems; the establishment of a capable networked command and control system; and standing up an accurate and interactive environmental system with the ability to form and disseminate a Common Environmental Picture. Efforts benefit the Mine Countermeasure (MCM) force by transforming the Navy from the platform-centered legacy set of systems to a capability-centered force that is distributed, networked, and able to provide unique maritime influence and access across the entire maritime domain.

The Surface and Shallow Water MCM systems consist of two programs: The USV program develops: (1) unmanned surface minehunting capability USVs designed to integrate MCM systems employed by the Littoral Combat Ship (LCS) Class and other vessels of opportunity (VOO) platforms and (2) the integration and improvement of new and existing MCM capabilities and payloads (Minesweeping Payload Deployment System [PDS] , Minehunting PDS, and Mine Neutralization PDS) to provide detection, classification, localization, identification, neutralization, and influence clearance capabilities.

The Barracuda system is an expendable, modular, mine neutralizer launched from the Mine Countermeasures (MCM) Unmanned Surface Vessel (USV) as part of the Littoral Combat Ship (LCS) MCM Mission Package (MP) to autonomously reacquire and neutralize previously detected near-surface mines. Upon entering the water, the vehicle will conduct a search, capture an image, and use a communications buoy to send the image to the operator in the MCM MP to evaluate the image and order the weapon to fire, abort, or continue searching. Future capabilities may include launch from manned or unmanned aircraft or vessels of opportunity as well as the ability to neutralize mines in volume and on the bottom.

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy					Date: March 2023
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 0603502N *I Surface & Shallow Water MCM*		
B. Program Change Summary ($ in Millions)	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**
Previous President's Budget	53.327	87.825	63.558	-	63.558
Current President's Budget	51.637	87.746	34.690	-	34.690
Total Adjustments	-1.690	-0.079	-28.868	-	-28.868
• Congressional General Reductions	-	-0.079			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.690	0.000			
• Program Adjustments	0.000	0.000	-34.459	-	-34.459
• Rate/Misc Adjustments	0.000	0.000	5.591	-	5.591

Change Summary Explanation

FY 2022: reduced by $1,690K for SBIR assessments

FY 2023: N/A

FY 2024: reduced by $28,868 for delayed Barracuda EDM delivery -$34,459K and increased by $5,220K for Barracuda Critical Test and misc. rate adjustments of $371K.

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*				Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
1234: *Unmanned Surface Vehicle (USV)*	179.895	19.637	24.887	14.463	-	14.463	16.898	19.481	19.041	19.371	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY20, the UISS program was subsumed into the MCM USV program.

A. Mission Description and Budget Item Justification

The MCM USV program consists of Unmanned Surface Vehicles (USVs) with Mine Countermeasures (MCM) payloads. The program began as the Unmanned Influence Sweep System (UISS) program which consisted of a USV paired with a magnetic and acoustic sweep capability. As the USV progressed, the Navy modified the program so the craft would integrated
and operate other payloads. The UISS program has been subsumed by the MCM USV program.
The program consists of four products:
1) The MCM USV is a semi-autonomous dual drive, 38 foot long, 10 foot wide aluminum hulled craft powered by two diesel engines. The craft contains a situational awareness and contact avoidance suite consisting of optical, radar, and GPS and is directed and monitored by by the Multi Vehicle Communication System (MVCS) with a host station, such as LCS, Vessel of Opportunity (VOO), or
shore site. The reconfigurable payload pay adds a modular mission capability enabling multiple payloads (mine sweep, mine hunt, mine neutralization).
2) The Mine Sweep Payload Delivery System (PDS) brings magnetic and acoustic mine influence sweep capability to the MCM USV. The PDS includes a winch, a magnetic sweep cable, and a Towed Acoustic Generator (TAG) along with capability to deploy and retrieve the towed equipment.
3) The Mine Hunt PDS brings a mine hunting capability by integrating the existing AN/AQS-20 on to the craft. The PDS includes a winch, cable and tow body handling equipment.
4) The Mine Neutralization PDS will neutralize mines previously identified throughout the water column using the Barracuda Mine Neutralizer. The PDS will consist of a launcher and communications gear to communicate with the neutralizer in the water.

The program completed IOT&E in FY21, and declared Initial Operational Capability in Q1FY22. Ship-based TECHEVAL and IOT&E completed in FY22. The UISS program reduced funding for Mine Neutralization Payload development prioritizing the completion of Minesweeping and Minehunting capabilities. In FY23, working with ONR, the MCM USV program will begin integration of a next generation Influence Sweep Payload (Magnetic & Acoustic Generation Next Unmanned Superconducting Sweep - MAGNUSS). Mine Neutralization payload design activities and Engineering Development Model (EDM) will start in FY26.

The MCM USV program will have a continuing reliability, autonomy and cyber-security engineering changes process. The program has developed improvements to address IOT&E findings. Leveraging ongoing developments for autonomous systems, the program will continue to develop performance improvements. Upgrades will consist of processing and sensing hardware, autonomy and situational awareness/collision avoidance algorithms. Engineering Change Proposals (ECPs) will be

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

delivered in blocks over a two year cycle. Cybersecurity ECPs will be developed, tested, and released twice a year starting in FY23. MCM USV will continue to support Navy experimentation of Beyond Line of Sight (BLOS) and alternative payloads.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MCM USV Product Development	12.922	16.661	6.632	0.000	6.632
Articles:	-	-	-	-	-
FY 2023 Plans: - Commence USV Advance Autonomy Development effort - Complete Top-Level Requirements for Barracuda effort. - Continue requirements definition of Mine Neutralization (Barracuda) payload and integration with MCM USV. - Commence integration planning of the next generation Influence Sweep Payload, Magnetic and Acoustic Generation Next Unmanned Superconducting Sweep (MAGNUSS)onto the MCM USV - Next Unmanned Superconducting Sweep (MAGNUSS) onto the MCM USV - Beyond Line of Sight communication testing.					
FY 2024 Base Plans: - Continue integration planning of the MAGNUSS payload on the MCM USV - Commence integration of new lower controller to facilitate an open autonomy system architecture for the MCM USV. - Integrate upgraded perception and situational suite into MCM USV.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease delayed integration of Barracuda payload on the MCM USV.					
Title: MCM USV Support	3.256	7.455	4.521	0.000	4.521
Articles:	-	-	-	-	-
FY 2023 Plans: - Execute performance, autonomy, and cybersecurity improvement process for ECPs. - Design and deliver hardware improvements for ECPs. - Develop preliminary software build plan for ECPs. - Develop, test, and release Cybersecurity ECPs. - Develop, test and release reliability ECPs. - Develop Maintainability enhancements ECPs					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Develop Maintainability enhancements ECPs ***FY 2024 Base Plans:*** - Continue its yearly development cycle to maintain the MCM USV Cybersecurity posture and compliance with updated requirements and instructions. - Incorporate ECP to introduce early MCM USV autonomy capability based on initial Fleet deployment feedback. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Decrease reflects FY23 focus on implementing ECPs and in FY2024 the program will maintain the MCM USV Cybersecurity posture.					
Title: MCM USV Test and Evaluation	3.313	0.625	3.064	0.000	3.064
Articles:	-	-	-	-	-
FY 2023 Plans: - Conduct integration related test analysis and reporting. Address findings from Minehunt TECHEVAL and IOT&E as well as MCM MP testing. ***FY 2024 Base Plans:*** - Conduct initial on-water testing of various autonomy engines installed on MCM USV, including range time and support craft requirements. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Increase supports autonomy on-water testing.					
Title: MCM USV Management Services	0.146	0.146	0.246	0.000	0.246
Articles:	-	-	-	-	-
FY 2023 Plans: - Provide program planning, management and acquisition document updates for the MCM USV program. - Manage payload development contract and options. ***FY 2024 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Provide program planning, management and acquisition document updates for the MCM USV program. - Manage payload development contract and options. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No significant change.					
Accomplishments/Planned Programs Subtotals	19.637	24.887	14.463	0.000	14.463

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/1601: *LCS MCM Mission Modules*	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640

Remarks

RDT&E/0603596N - Funding shown only reflects funding for required USV development efforts.

OPN/1601 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.

OPN/2622 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.

D. Acquisition Strategy

UISS - Requirements are documented in the Unmanned Influence Sweep System (UISS) Capability Production Document (CPD). An Engineering and Manufacturing Development (E&MD) contract was awarded in FY14 with options for Low Rate Initial Production (LRIP) in FY19.

In FY20, Mine Countermeasure Unmanned Surface Vehicle (MCM USV) awarded three LRIP craft with sweep payload, following a Milestone C Decision on development contract.
In FY20-21, MCM USV developed a Capability Production Document (CPD) Annex leveraging existing requirements (UISS, AN/AQS-20, MCM MP, etc.).

In FY21, MCM USV craft and Minesweep Payload completed IOT&E testing, validating technical data package for production. Program transitioned from concept development to mine neutralization initial requirements definition and design. Based on demonstrated performance improvements, a fourth UISS LRIP was authorized and procured.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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In FY22, MCM USV completed IOT&E for Minehunt Payload (with AN/AQS-20C). Continued requirements definition of the mine neutralization payload. Minehunt Payload LRIP/s will be procured to support MP requirements. A five-year MCM USV production contract was awarded to Bollinger Shipyards LLC (Lockport, LA).

In FY23, MCM USV will continue mine neutralization payload requirements definition. In FY23, working with ONR, the MCM USV program will begin integration of the next generation Influence Sweep Payload (Magnetic & Acoustic Generation Next Unmanned Superconducting Sweep - MAGNUSS). Support testing of Beyond Line of Sight (BLOS) communications solution.

In FY24, Minesweeping PDS and Minehunting PDS production will be procured under the Multiple Award Contracts (MAC) Indefinite Delivery Indefinite Quantity (IDIQ) USV Family of Systems (FoS) Contract.

In FY26, the program will start Mine Neutralization Engineering Design Model design, fabrication and integration onto the craft. Commence MAGNUSS EDM payload integration with USV craft.

In FY27, continue MAGNUSS integration actives, which includes an At-Sea Demonstration.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Product Development	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	33.145	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Product Development	SS/CPFF	JHU APL : Laurel, MD	12.215	0.000		0.000		0.000		-		0.000	0.000	12.215	-
MHU: Product Development	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	7.545	0.000		0.000		0.000		-		0.000	0.000	7.545	-
MHU: Product Development	WR	NSWC PC : Panama City, FL	0.922	0.000		0.000		0.000		-		0.000	0.000	0.922	-
MHU: Product Development	WR	NUWC N : Newport, RI	0.740	0.000		0.000		0.000		-		0.000	0.000	0.740	-
MHU: Product Development	WR	NSWC CD : Bethesda, MD	0.235	0.000		0.000		0.000		-		0.000	0.000	0.235	-
MHU: Product Development	WR	Various : Various	0.570	0.000		0.000		0.000		-		0.000	0.000	0.570	-
MCM USV: Product Development 1	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	2.050	0.000		0.000		0.000		-		0.000	0.000	2.050	-
MCM USV: Product Development 2	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	15.559	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development1	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	17.421	1.021	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	Raytheon : Portsmouth, RI	14.977	0.300	Feb 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	JHU APL : Laurel, MD	3.250	1.235	Feb 2022	1.316	Feb 2023	3.912	Feb 2024	-		3.912	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC PC : Panama City, FL	8.976	1.652	Nov 2021	3.552	Dec 2022	1.236	Dec 2023	-		1.236	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NUWC N : Newport, RI	1.991	0.323	Nov 2021	0.078	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC CD : Bethesda, MD	4.327	0.443	Nov 2021	0.892	Dec 2022	1.484	Dec 2023	-		1.484	Continuing	Continuing	Continuing
MCM USV: Product Development	C/IDIQ	Various : Various	0.000	7.948	Jan 2022	9.881	Jan 2023	0.000		-		0.000	0.000	17.829	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Product Development	WR	NSWC PH : Philadelphia, PA	0.000	0.000		0.899	Oct 2022	0.000		-		0.000	0.000	0.899	-
		Subtotal	123.923	12.922		16.618		6.632		-		6.632	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Engineering Support	WR	NUWC N : Newport, RI	0.850	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC PC : Panama City, FL	2.289	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC CD : Bethesda, MD	1.911	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.270	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.665	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.951	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.128	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	SSC PAC : San Diego, CA	0.444	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NSWC PC : Panama City, FL	3.460	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NUWC N : Newport, RI	0.853	0.000		0.000		0.000		-		0.000	0.000	0.853	-
MHU: Engineering Support	WR	NSWC CD : Bethesda, MD	0.384	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	Various : Various	0.520	0.000		0.000		0.000		-		0.000	0.000	0.520	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Engineering Support	WR	NSWC PC : Panama City, FL	7.916	1.354	Nov 2021	3.149	Dec 2022	0.578	Dec 2023	-		0.578	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NUWC N : Newport, RI	4.113	0.434	Nov 2021	0.230	Dec 2022	0.212	Dec 2023	-		0.212	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NSWC CD : Bethesda, MD	0.935	0.232	Nov 2021	2.597	Dec 2022	0.570	Dec 2023	-		0.570	0.000	4.334	-
MCM USV: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.805	0.423	Nov 2021	1.522	Dec 2022	3.161	Dec 2023	-		3.161	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.161	0.219	Nov 2021	0.000		0.000		-		0.000	0.000	0.380	-
MCM USV: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.150	0.092	Nov 2021	0.000		0.000		-		0.000	0.000	0.242	-
MCM USV: Integrated Logistics	SS/CPFF	Raytheon : Portsmouth, RI	0.978	0.050	Jan 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	SS/CPFF	Northrup Grumman : Annapolis, MD	0.778	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	2.239	0.452	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	33.800	3.256		7.498		4.521		-		4.521	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PC : Panama City, FL	2.055	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC CD : Bethesda, MD	1.731	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	1.884	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC PC : Panama City, FL	6.015	1.495	Dec 2021	0.343	Dec 2022	3.064	Nov 2023	-		3.064	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC CD : Bethesda, MD	2.579	0.897	Dec 2021	0.282	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	SS/CPFF	Raytheon : Portsmouth, RI	1.225	0.323	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	3.086	0.598	Dec 2021	0.000		0.000		-		0.000	0.000	3.684	-
		Subtotal	18.575	3.313		0.625		3.064		-		3.064	Continuing	Continuing	N/A

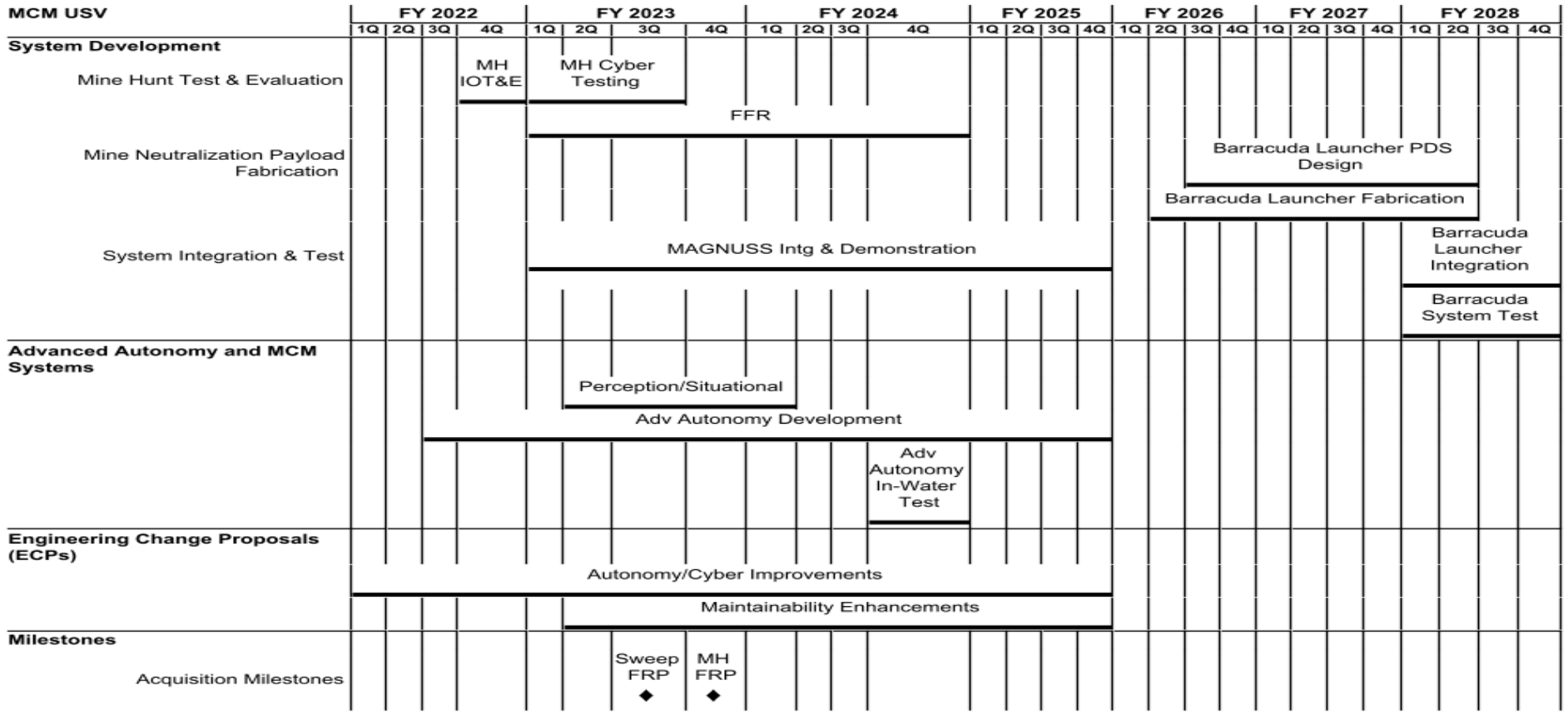
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Travel	WR	NAVSEA : Washington, DC	0.295	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Management	C/CPAF	TBD : TBD	2.274	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Travel	WR	NAVSEA : Washington, DC	0.389	0.069	Jan 2022	0.055	Jan 2023	0.053	Jan 2024	-		0.053	Continuing	Continuing	Continuing
MCM USV: Management	C/CPAF	TBD : TBD	0.639	0.077	Nov 2021	0.091	Nov 2022	0.193	Jan 2024	-		0.193	Continuing	Continuing	Continuing
		Subtotal	3.597	0.146		0.146		0.246		-		0.246	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	179.895	19.637		24.887		14.463		-		14.463	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*



2024PB - 0603502N - 1234

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MCM USV				
System Development: Mine Hunt Test & Evaluation: Mine Hunt (MCM USV +AQS-20) IOT&E	4	2022	4	2022
System Development: Mine Hunt Test & Evaluation: Mine Hunt Cyber Testing	1	2023	3	2023
System Development: Mine Hunt Test & Evaluation: MH post test Find Fix & Repair	1	2023	4	2024
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher / Payload Delivery System (PDS) Design	3	2026	2	2028
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher Fabrication	2	2026	2	2028
System Development: System Integration & Test: MAGNUSS Integration and Deomonstration	1	2023	4	2025
System Development: System Integration & Test: Barracuda Launcher Integration	1	2028	4	2028
System Development: System Integration & Test: Barracuda System Test	1	2028	4	2028
Advanced Autonomy and MCM Systems: Perception/Situational Awareness Improvements	2	2023	1	2024
Advanced Autonomy and MCM Systems: Advanced Autonomy Integration	3	2022	4	2025
Advanced Autonomy and MCM Systems: MCM USV Advanced Autonomy In-Water Test	4	2024	4	2024
Engineering Change Proposals (ECPs): Autonomy/Cyber Improvements (Ongoing)	1	2022	4	2025
Engineering Change Proposals (ECPs): MCM USV Enhancements (Ongoing)	2	2023	4	2025
Milestones: Acquisition Milestones: Minesweeping PDS Full Rate Production	3	2023	3	2023
Milestones: Acquisition Milestones: Minehunting PDS Full Rate Production	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2989 / *Barracuda*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2989: *Barracuda*	103.372	32.000	62.859	20.227	-	20.227	9.100	6.813	8.333	8.604	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY 2023 to FY 2024 decrease corresponds with Barracuda Program completion of Critical Design Review and Engineering Development Model fabrication in FY 2023

The Barracuda system is an expendable, modular, mine neutralizer launched from the Mine Countermeasures (MCM) Unmanned Surface Vessel (USV) as part of the Littoral Combat Ship (LCS) MCM Mission Package (MP) to autonomously reacquire and neutralize previously detected near-surface mines. Upon entering the water, the vehicle will conduct a search, capture an image, and use a communications buoy to send the image to the operator in the MCM MP to evaluate the image and order the weapon to fire, abort, or continue searching.

Future capabilities may include launch from manned or unmanned aircraft or vessels of opportunity as well as the ability to neutralize mines in volume and on the bottom.

The Barracuda detailed design and development contract includes system design, program management, systems engineering, software development, integrated product support and contractor testing.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Barracuda: Product Development	28.050	58.661	16.081	0.000	16.081
Articles:	-	-	-	-	-
FY 2023 Plans: - Complete final Critical Design Review for detailed design and initial product baseline. - Develop and award contract option for Barracuda Engineering Development Models (EDMs). - Conduct full vehicle assembly, integration, and checkout of contractor test assets based on the detailed design delivered to the Government at the Critical Design Review. - Commence qualification testing of contractor test assets to verify the detailed design, assembly, and integration of vehicles and support equipment against contract requirements.					
FY 2024 Base Plans: - Continue full vehicle assembly, integration, and checkout of contractor test assets based on the detailed design delivered to the Government at the Critical Design Review. - Continue Engineering Development Model fabrication for planned FY 2025 deliveries.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue qualification testing of contractor test assets to verify the detailed design, assembly, and integration of vehicles and support equipment against contract requirements. - Commence performance testing of contractor test assets for initial verification of system performance requirements prior to Government testing. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY 2023 to FY 2024 decrease corresponds with program completion of CDR in FY 2023 and Barracuda EDM delivery delay into FY 2025.					
Title: Barracuda: Engineering Support	3.650	3.881	3.944	0.000	3.944
Articles:	-	-	-	-	-
FY 2023 Plans: - Support final Critical Design Review for approval of detailed design and initial product baseline. - Continue to conduct and manage technical documents, safety reviews, and contractor test plans and reports. - Continue management of contract deliverables and begin transition of system configuration management to the Government. - Continue to coordinate host and deployment platform compatibility and integration efforts. ***FY 2024 Base Plans:*** -Continue to conduct and manage technical documents, safety reviews, and contractor test plans and reports. -Continue to coordinate host and deployment platform compatibility and integration efforts. -Provide Government oversight of contractor test asset and Engineering Development Model fabrication. -Provide Government oversight of contractor qualification and performance testing. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No significant scope changes from FY 2023 to FY 2024.					
Title: Barracuda: Management Services	0.300	0.317	0.202	0.000	0.202
Articles:	-	-	-	-	-
FY 2023 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue to provide program management, financial management and engineering support. ***FY 2024 Base Plans:*** Continue to provide program management, financial management and engineering support. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No significant scope changes from FY 2023 to FY 2024.					
Accomplishments/Planned Programs Subtotals	32.000	62.859	20.227	0.000	20.227

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Barracuda program awarded a competitive contract in FY 2018 to Raytheon Technologies Missiles and Defense (formerly Raytheon Integrated Defense Systems) in Portsmouth, RI. The Barracuda program is developing a semi-autonomous mine neutralization system that will be incorporated in LCS MCM MP. Initial concepts were based on small UUVs developed as part of the ONR Single Sortie, Detect to Engage Future Naval Capabilities project (FY 2015-FY 2018).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Hardware/ Support	C/CPIF	Raytheon (Integrated Defense Systems) : Portsmouth, RI	86.672	28.050	Dec 2021	58.661	Dec 2022	16.081	Dec 2023	-		16.081	Continuing	Continuing	Continuing
		Subtotal	86.672	28.050		58.661		16.081		-		16.081	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Engineering Support	WR	NUWC NPT : Newport, RI	1.674	0.389	Dec 2021	0.412	Dec 2022	0.413	Dec 2023	-		0.413	0.000	2.888	-
Barracuda Engineering Services	C/CPIF	JHU APL : Baltimore, MD	2.030	0.512	Dec 2021	0.543	Dec 2022	0.481	Dec 2023	-		0.481	0.000	3.566	-
Barracuda Engineering Support	WR	NSWC, PC : Panama City, FL	6.783	2.064	Nov 2021	2.174	Nov 2022	2.541	Nov 2023	-		2.541	0.000	13.562	-
Barracuda Support	WR	NSWC, IHD : Indian Head, MD	3.174	0.310	Nov 2021	0.333	Nov 2022	0.344	Nov 2023	-		0.344	0.000	4.161	-
Barracuda Support	WR	Naval Research Lab : Washington, DC	0.926	0.089	Dec 2021	0.111	Dec 2022	0.055	Dec 2023	-		0.055	0.000	1.181	-
Barracuda Support	WR	NSWC, Carderock : Bethesda, MD	1.069	0.286	Nov 2021	0.308	Nov 2022	0.110	Nov 2023	-		0.110	0.000	1.773	-
		Subtotal	15.656	3.650		3.881		3.944		-		3.944	0.000	27.131	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Management Support	WR	NSWC, PC : Panama City, FL	1.044	0.300	Nov 2021	0.317	Nov 2022	0.202	Nov 2023	-		0.202	1.674	3.537	-
		Subtotal	1.044	0.300		0.317		0.202		-		0.202	1.674	3.537	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2989 / *Barracuda*	

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	103.372	32.000		62.859		20.227		-		20.227	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

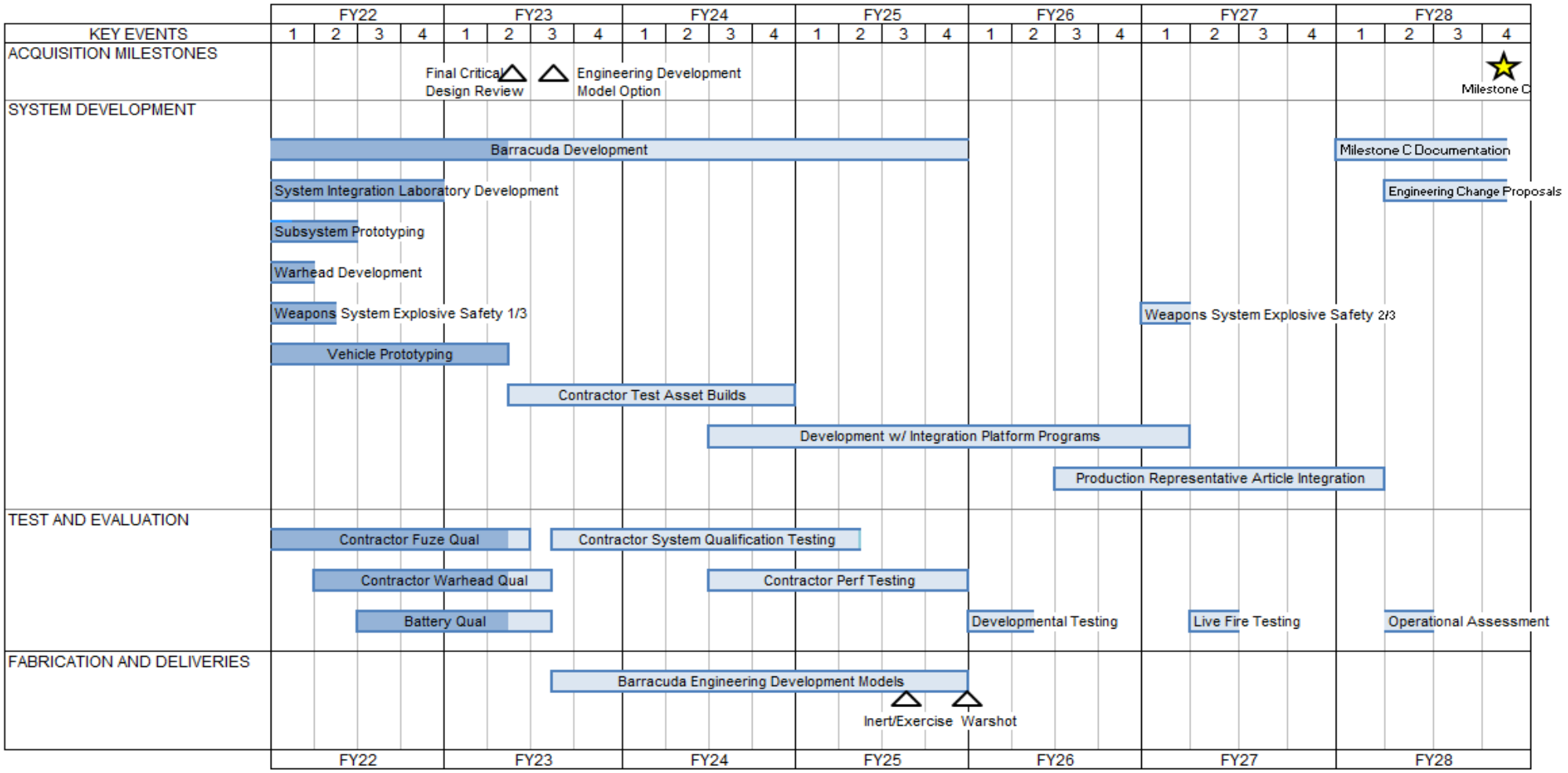


Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones				
Barracuda Acquisition Milestones: Final Critical Design Review	2	2023	2	2023
Barracuda Acquisition Milestones: Engineering Development Models (EDM) Contract Option	3	2023	3	2023
System Development: Barracuda Development	1	2022	4	2025
System Development: Systems Integration Laboratory Development	1	2022	4	2022
System Development: Subsystem Prototyping	1	2022	2	2022
System Development: Warhead Development	1	2022	1	2022
System Development: Weapons Systems Explosive Safety Review Board 1/3	1	2022	2	2022
System Development: Vehicle Prototyping	1	2022	2	2023
System Development: Contractor Test Asset Builds	2	2023	4	2024
System Development: Weapons Systems Explosive Safety Review Board 2/3	1	2027	1	2027
System Development: Development with Integration Platform Programs	3	2024	1	2027
System Development: Production Representative Article Integration	3	2026	1	2028
Test and Evaluation: Contractor Fuze Qualification	1	2022	2	2023
Test and Evaluation: Contractor Warhead Qualification	2	2022	3	2023
Test and Evaluation: Contractor Battery Qualification	3	2022	3	2023
Test and Evaluation: Contractor System Qualification	3	2023	2	2025
Test and Evaluation: Contractor System Performance	3	2024	4	2025
Test and Evaluation: Developmental Testing	1	2026	2	2026
Test and Evaluation: Live Fire Testing	2	2027	2	2027
Test and Evaluation: Operational Assessment	2	2028	2	2028

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: Engineering Development Models (EDMs) Fabrication	3	2023	3	2025
Deliveries: Exercise/Inert Variant EDMs Delivery	3	2025	3	2025
Deliveries: Warshot Variant EDMs Delivery	4	2025	4	2025