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 0603596N *I LCS Mission Modules*							
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	725.412	105.412	77.573	75.995	-	75.995	-	-	-	-	-	-
2550: *Mine Countermeasure (MCM) Mission Package*	40.175	39.110	26.775	49.989	-	49.989	-	-	-	-	-	-
2551: *Anti-Submarine Warfare (ASW) Mission Package*	39.925	39.951	23.791	17.268	-	17.268	-	-	-	-	-	-
2552: *Surface Warfare (SUW) Mission Package*	10.923	16.870	8.079	0.000	-	0.000	-	-	-	-	-	-
3129: *LCS Mission Package Development*	634.389	9.481	8.928	8.738	-	8.738	-	-	-	-	-	-
9999: *Congressional Adds*	0.000	0.000	10.000	0.000	-	0.000	-	-	-	-	-	-
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 443												

A. Mission Description and Budget Item Justification

The Littoral Combat Ship (LCS) Mission Modules (MM) Program Element (PE) provides funds for detailed design, development, issue resolution, certification, integration, and testing of the LCS MM. LCS is a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and ensure naval and joint force access into contested littoral regions. It uses open-systems architecture design, modular weapons, sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littorals.

The LCS MM Program employs an incremental development approach to deliver capability, which allows for insertion of mature capabilities throughout the life of the program without the need for modifications to the seaframes. Future capabilities will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective, enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, which is one of the most important benefits of LCS modular design.

Beginning in FY 2019, Mission Package funding is realigned into four (4) projects:
2550 Mine Countermeasures (MCM) Mission Package
2551 Anti-Submarine Warfare (ASW) Mission Package
2552 Surface Warfare (SUW) Mission Package
3129 LCS Mission Package Development

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 0603596N *I LCS Mission Modules*

Prior to FY 2019 all Mission Package funding was in Project 3129.

MCM MP: Counters bottom, tethered, near surface, and surface mines in the littorals without putting sailors in the minefield.

SUW MP: Increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes while moving a force quickly through a choke point or other strategic waterway, and to conduct maritime security missions.

ASW MP: Enables the LCS to conduct detect-to-engage operations against modern submarines.

C5I: Enabling products required by all MPs such as common hardware interfaces, computer operating environment (Mission Package Computing Environment (MPCE)), communications systems (Multi-Vehicle Communications System (MVCS)), aviation interface systems, and Mission Package Portable Control Stations (MPPCS). MPCE provides common services and an Operating Environment to support all Mission Package Application Software (MPAS) and Open Architecture Products. MVCS enables the simultaneous control and data exchange between unmanned mission vehicles and the ship. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. MPPCS provides a mobile operating environment installed in a 20ft ISO container and serves as a surrogate ship during mission package development and integration test events at test ranges.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	108.505	67.875	54.332	-	54.332
Current President's Budget	105.412	77.573	75.995	-	75.995
Total Adjustments	-3.093	9.698	21.663	-	21.663
• Congressional General Reductions	-	-0.302			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.093	0.000			
• Program Adjustments	0.000	0.000	22.969	-	22.969
• Rate/Misc Adjustments	0.000	0.000	-1.306	-	-1.306

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 9999: *Congressional Adds*		
Congressional Add: *LCS Anti-Submarine Warfare Escort Mission Module Test Ship installation*	0.000	10.000

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 0603596N *I LCS Mission Modules*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add Subtotals for Project: 9999	0.000	10.000
Congressional Add Totals for all Projects	0.000	10.000

Change Summary Explanation

In FY 2022, the MCM MP completes formal testing on Independence variant and achieves IOC, initiates formal testing on Freedom variant, and continues integration and testing on Vessels Of Opportunity (VOO). The ASW MP completes development of ACB/TI 20.19L, initiates tech refresh development of ACB/TI 24.23L, completes testing on Independence variant, and prepares to certify the ASW MP for operational use and deployment. The SUW MP will complete all developmental efforts and transition to sustainment in FY 2021. In FY 2022, project 3129 (LCS Mission Package Common Development) efforts include continuing MPCE v2.0 tech refresh development and initiation of MVCS v1.3 tech refresh development.

FY 2020 -$3.093M SBIR
FY 2021 +$10.000M ASW Congressional Add
FY 2022 +$3.269M VOO Integration, +$4.713M MCM MP Wholeness, +$14.987M MCM MP T&E and -$1.306M Misc 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 0603596N / *LCS Mission Modules*	Project (Number/Name) 2550 / *Mine Countermeasure (MCM) Mission Package*	

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
2550: *Mine Countermeasure (MCM) Mission Package*	40.175	39.110	26.775	49.989	-	49.989	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 443

A. Mission Description and Budget Item Justification

The MCM Mission Package (MP) employs an incremental development approach to deliver capability which allows the continued insertion of mature capabilities throughout the life of the program without the need for modifications to the seaframes. The focus is to minimize service life extensions to both MCM-1 ships and the MH-53E helicopters. Future MCM MP capabilities will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, one of the most important benefits of LCS modular design.

The program has begun investigation into the feasibility of integrating the MCM MP on Vessels of Opportunity (VOO). In FY 2019 and FY 2020, the program demonstrated the flexibility of the modular MCM MP components by conducting a MCM Vessel of Opportunity (VOO) at-sea demonstration onboard the USS Hershel "Woody" Williams (T-ESB 4).

The MCM MP will counter deep, shallow, and tethered mines in the littorals without putting sailors in the minefield. When the MCM MP is embarked, LCS is capable of conducting detect-to-engage operations (hunting, sweeping, and neutralization) against very shallow to deep-water sea mine threats. The MCM MP provides these capabilities through the use of sensors and weapons deployed from an MH-60S multi-mission helicopter, unmanned offboard vehicles, and support equipment/ containers. The MCM MP consists of the following modules:

- Unmanned Minesweeping (UMS) Module: Unmanned Influence Sweeping System (UISS) (USV + Minesweeping Payload Delivery System (PDS))
- Airborne Mine Neutralization (AMN) Module: Airborne Mine Neutralization System (AMNS) + MH-60S helicopter
- Near Surface Detection (NSD) Module: Airborne Laser Mine Detection System (ALMDS) + MH-60S helicopter
- Coastal Mine Reconnaissance (CMR) Module: Coastal Battlefield Reconnaissance & Analysis (COBRA) + MQ-8B Fire Scout Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV)
- Buried Minehunting (BMH) Module: Knifefish Unmanned Undersea Vehicle (UUV)
- Remote Minehunting (RMH) Module: Unmanned Surface Vehicle (USV) + Minehunting PDS + AN/AQS-20 Minehunting Sonar

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Mine Countermeasures (MCM) Mission Modules	39.110	26.775	49.989	0.000	49.989

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Articles:	-	-	-	-	-
FY 2021 Plans: Unmanned Minesweeping (UMS) Module: - Support UISS TECHEVAL and IOT&E - Certify UMS for deployment on Independence variant - Commence UMS Integration on Freedom variant - Complete UISS Launch & Recovery testing and conduct UMS Integration Testing on Freedom variant Buried Minehunting (BMH) Module: - Complete Knifefish Launch & Recovery testing and conduct BMH Integration Testing on Freedom variant - Continue to integrate Knifefish Post Mission Analysis (PMA) into LCS MPCE hardware Remote Minehunting (RMH) Module: - Support MCM USV with AQS-20C DT on Independence variant - Conduct RMH Integration Testing on Independence variant MCM MP TESTING: - Develop and incorporate of PTRs into MCM MPAS Build 3.0 to support MCM MP Developmental Testing and IOT&E - Conduct MCM MPAS Build 3.0.0.0.310 baseline integration testing in support of BMH Mission Module / LCS Independence variant testing - Conduct UVMS 5.3.0.0 testing, MCM MPAS Build 3.0.0.0ERxP1 and ERx2 testing in the Mission Package Integration Lab (MPIL) in support of MCM MP testing on Independence variant - Conduct MCM MPAS Build 3.X Combat System Interface testing at Lockheed Martin Mission Systems Integration Center (MSIC) in support of Freedom variant integration - Implement Cyber Security Attributes (CSA) Phase 1 for MCM MPAS Build 3.0 - Conduct end-to-end MCM MP Developmental Test Planning in support of DT Phase 1, DT Phase 2, and DT-C10 on Independence variant					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
The tactics team will continue to conduct test analysis for both the Freedom and Independence variants. Execute test scenarios on the Naval Mine Warfare Simulator (NMWS) to support certification events, Mission Package Readiness Assessments (MPRAs), and the Tactical Action Working Group meetings. Continue vendor training for MCM MP crews until outfitting of LCS Training Facilities is completed in FY 2023, to include crew travel to facilities. Perform systems engineering (risk management, information assurance, human systems integration, safety), configuration management, and Integrated Logistics Support (ILS). Conduct MCM MP Logistics Tabletop Exercise. Continue to compile system and package level Reliability and Maintainability (RAM-C) data to support reliability engineering and a prioritized initial spares list; incorporate RAM-C analysis with updated data and update the RAM-C Rationale Report. Continue MCM MP Failure Reporting, Analysis, and Corrective Action System (FRACAS) efforts. Complete update and gain approval of MCM MP Capability Development Document (CDD) and update MCM MP System/Subsystem Specification. ***FY 2022 Base Plans:*** MCM MP Product Development - Achieve MCM MP Initial Operational Capability (IOC) - Certify MCM MP for deployment on Independence variant - Integrate MCM Mission Package onto Freedom Variant - Combat systems integration and testing - Resolve and update MPAS Build 3.0 to incorporate all MCM MP test findings and certify MPAS Build 3.0 - Incorporate MPAS Build 3.0 into CMPT - Commence integration of Common Control System (CCS) into MCM MPAS Build 4.0 - Complete the integration of the Knifefish Support container into the MCM MP - Conduct Cyber Development, to include development and implementation of an IA patch strategy for MPAS and the Mission Package Operating Environment (MPOE) - Monitor Barracuda development efforts to ensure system development accounts for eventual integration into MCM MP					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
MCM MP Test & Evaluation - Place and remove exercise mines in a minefield along with 24-hour monitoring of the mine field with an at-sea chase boat for the duration of testing - Conduct test analysis of all testing scenarios for both Independence and Freedom variants - Support MCM USV and AQS-20C DT/OT on Independence variant - Conduct end-to-end MCM MP DT, TECHEVAL, and IOT&E for fielding on Independence Variant - Certify MCM MP for fielding based on executed IOT&E - Support Knifefish Block I DT and IOT&E on Independence Variant - Deliver and install Knifefish PMA into LCS MPCE hardware - Support MCM USV + Hunt DT/OT on Freedom Variant - Conduct UMS Integration testing on Freedom Variant - Certify UMS Module for deployment on Freedom Variant - Conduct RMH Integration Testing on Freedom Variant - Conduct BMH Integration Testing on Freedom Variant					
MCM MP Support - Certify the LCS MCM MP Logistic products and training material, including technical manuals and provisioning documentation, in preparation for IOC of the MCM MP in FY 2022 - Continue development of the MCM MP training package from interim training to Navy schoolhouse supported training to support the establishment of Ready for Training (RFT) - Compile mission system and mission package reliability and Maintainability (RAM-C) data to support reliability engineering and prioritized initial spares list.					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: Increased cost associated with conducting end-to-end MCM MP testing, including IOT&E, on Independence variant and the lead up to MCM MP IOC decision in FY 2022. Additional funding required due to Cyber Security Testing on Independence variant and MCM MP testing (DT Phase 1, DT Phase 2) on Freedom variant. Program					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
is conducting MCM MP testing on both Independence and Freedom variants in FY 2022. Program is funded for integration efforts of MCM MP on various Vessels Of Opportunity (VOO) in FY 2022.					
Accomplishments/Planned Programs Subtotals	39.110	26.775	49.989	0.000	49.989

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 1600: *LCS Common Mission Modules Equipment*	38.730	36.323	74.231	-	74.231	-	-	-	-	-	-
• OPN 1601: *LCS MCM Mission Modules*	64.789	189.397	40.630	-	40.630	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The LCS MM Acquisition Strategy employs an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability as technology is matured, into the MCM MP until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

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
MCM MP	WR	NSWC PCD : Panama City, FL	19.604	13.487	Nov 2019	4.480	Dec 2020	35.895	Oct 2021	-		35.895	-	-	-
MCM MP	Sub Allot	PMS 406 : Various	5.000	2.650	Nov 2019	0.000		0.000		-		0.000	-	-	-
MCM MP	Sub Allot	PMS 495 : Various	1.000	0.000		0.000		0.000		-		0.000	-	-	-
MCM MP	WR	NSWC PHD : Port Hueneme, CA	4.571	5.000	Mar 2020	0.000		0.000		-		0.000	-	-	-
MCM MP	C/CPFF	Northrop Grumman : Bethpage, NY	9.600	3.700	Jan 2020	4.047	Nov 2020	2.700	Oct 2021	-		2.700	-	-	-
		Subtotal	39.775	24.837		8.527		38.595		-		38.595	-	-	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
MCM MP Test Support	WR	NSWC PCD : Panama City, FL	0.000	13.772	Nov 2019	13.319	Dec 2020	0.000		-		0.000	-	-	-
MCM MP Test Support	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		4.432	Jan 2021	10.572	Oct 2021	-		10.572	-	-	-
		Subtotal	0.000	13.772		17.751		10.572		-		10.572	-	-	N/A

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
MCM Program Management	C/CPFF	Booz Allen Hamilton : Washington, DC	0.400	0.501	Oct 2019	0.497	Nov 2020	0.822	Oct 2021	-		0.822	-	-	-
		Subtotal	0.400	0.501		0.497		0.822		-		0.822	-	-	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 0603596N / *LCS Mission Modules*	Project (Number/Name) 2550 / *Mine Countermeasure (MCM) Mission Package*	

	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	40.175	39.110		26.775		49.989		-		49.989	-	-	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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

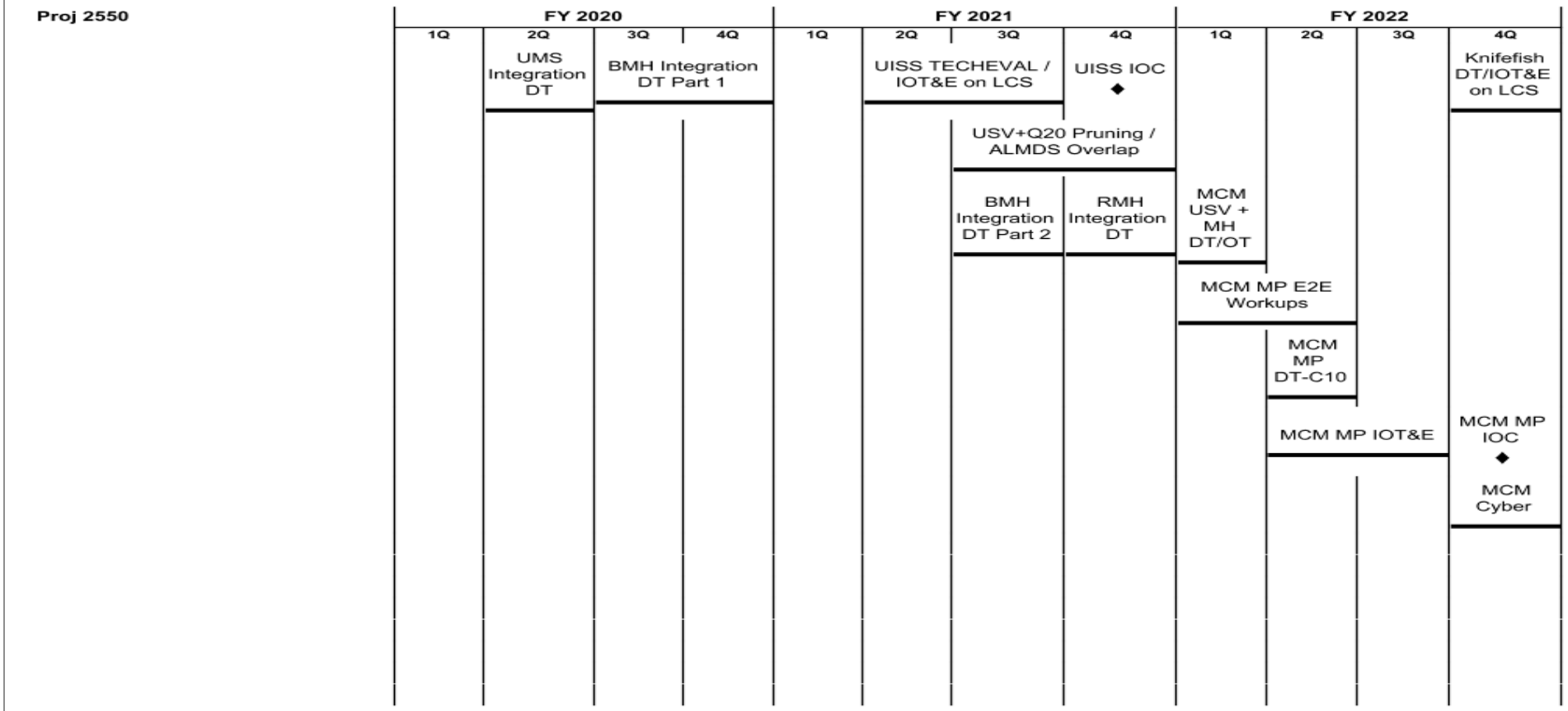

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

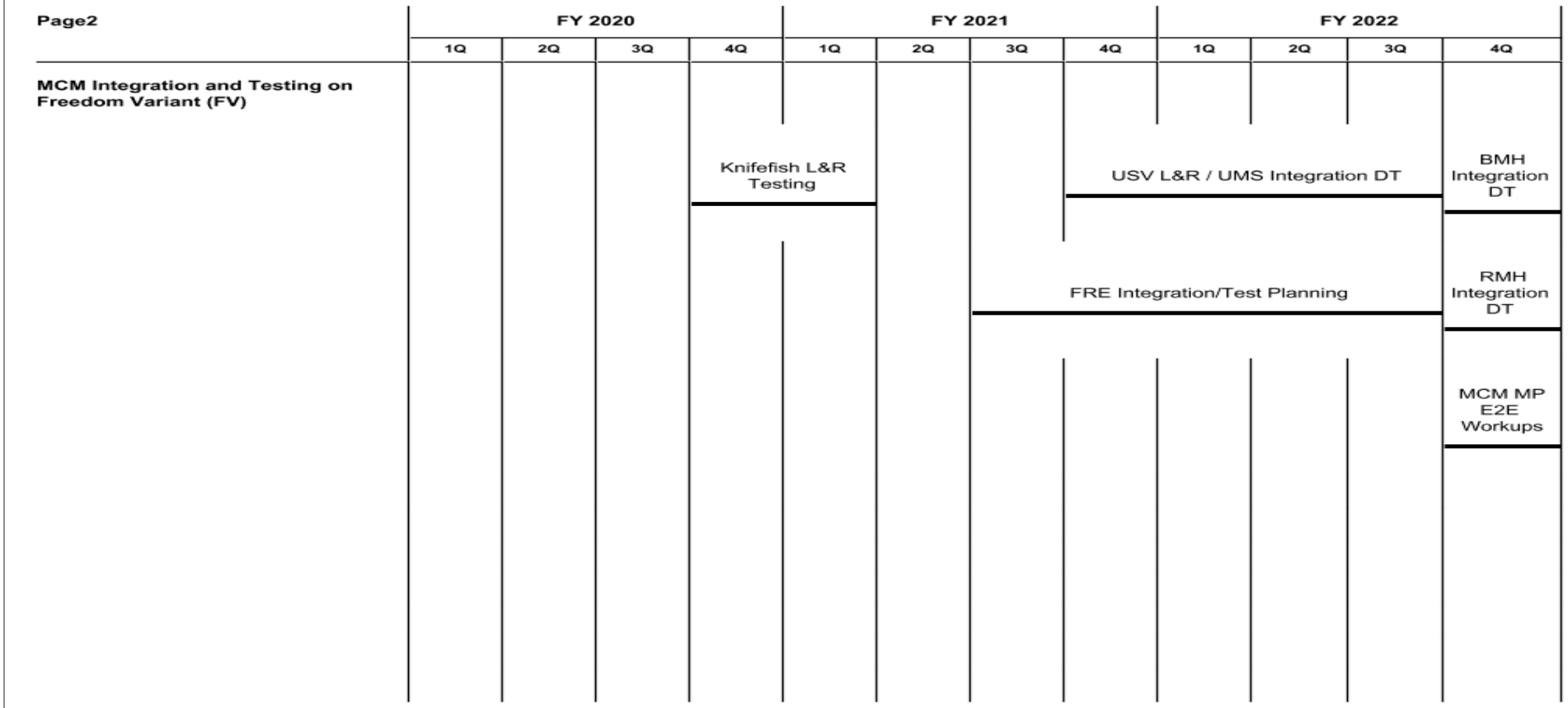

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2550				
BMH Integration Testing	3	2020	4	2020
UMS MM/LCS Integration DT (DT-B10 Phase 1)	2	2020	2	2020
UISS TECHEVAL / IOT&E (LCS-Based)	2	2021	3	2021
UISS IOC	4	2021	4	2021
Knifefish DT/IOT&E (LCS-Based)	4	2022	4	2022
USV+Q20 Pruning & ALMDS Overlap Test (Shore-NSWC PC)	3	2021	4	2021
BMH MM/LCS Integration DT (DT-B10 Phase 2)	3	2021	3	2021
RMH MM/LCS Integration DT (DT-B10 Phase 3)	4	2021	4	2021
MCM USV + MH DT/OT	1	2022	1	2022
MCM MP End-to-End (E2E) Workups	1	2022	2	2022
DT-C10 TECHEVAL	2	2022	2	2022
OT-C10 IOT&E	2	2022	3	2022
MCM MP IOC on Independence Variant	4	2022	4	2022
MCM Cyber Security Testing	4	2022	4	2022
Page2				
MCM Integration and Testing on Freedom Variant (FV): Knifefish L&R Testing	4	2020	1	2021
MCM Integration and Testing on Freedom Variant (FV): USV Launch and Recovery / UMS Integration DT (DT-B9 Phase 1)	4	2021	3	2022
MCM Integration and Testing on Freedom Variant (FV): BMH MM/LCS Integration DT (DT-B9 Phase 2)	4	2022	4	2022
MCM Integration and Testing on Freedom Variant (FV): RMH MM/LCS Integration DT (DT-B9 Phase 3)	4	2022	4	2022

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2550 / *Mine Countermeasure (MCM) Mission Package*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MCM Integration and Testing on Freedom Variant (FV): Freedom Integration/Test Planning	3	2021	3	2022
MCM Integration and Testing on Freedom Variant (FV): MCM MP End-to-End (E2E) Workups	4	2022	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 0603596N / *LCS Mission Modules*	Project (Number/Name) 2551 / *Anti-Submarine Warfare (ASW) Mission Package*	

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
2551: *Anti-Submarine Warfare (ASW) Mission Package*	39.925	39.951	23.791	17.268	-	17.268	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 443

A. Mission Description and Budget Item Justification

The ASW MP enables LCS to conduct detect-to-engage operations against submarines. Specific ASW capabilities include protecting forces in transit, protecting joint operating areas, and establishing ASW barriers. The ASW MP provides the warfighter capabilities that can be employed for ASW area search as well as high value unit escort missions. Key components of the ASW MP include a Variable Depth Sonar, a Multi-Function Towed Array and sonar signal processing systems. The individual systems are combined into modules: an ASW Escort Mission Module (EMM) that provides High Value Unit (HVU) escort capability and an Aviation Module that offers airborne threat localization and engagement capability through a MH-60R with MK54 torpedoes.

This project delivered the ASW EMM Pre-Production Test Article (PPTA) and the Aviation Module in Q1 FY 2019. Following the delivery of the PPTA, the ASW MP was installed on board a Freedom variant hull in Q4 FY 2019, to support Developmental Testing (DT). The project conducted DT on USS Fort Worth (LCS 3) in FY 2020 and FY 2021 and is incorporating lessons learned from testing to improve ASW MP reliability and hydrodynamic stability. In FY 2021, design updates were incorporated to improve reliability and the project is undergoing hydrodynamic testing to increase performance in turns and at higher speeds. The ASW MP will continue hydrodynamic improvements in FY 2021 with White Ship Testing and will continue DT, TECHEVAL, and IOT&E on LCS 3 in FY 2021 and FY 2022, with IOC in Q3 FY 2022. The schedule to achieve IOC as presented in this budget submission assumes all testing to support the IOC decision is completed on LCS 3.

ASW MP testing on Independence variant will be conducted following completion of testing on Freedom variant. The Program initiated ship design efforts in FY 2021 to integrate and install the ASW MP on Independence variant in preparation for testing. ASW MP performance will continue to be demonstrated on Freedom variant with hydrodynamic and LCS-based testing in FY 2021 and FY 2022, with IOC in Q3 FY 2022. Because the ASW MP is embarked with its own sonar signal processing system, Independence variant testing is focused on the physical integration and employment/recovery.

The ASW MP will take advantage of improvements developed under the submarine Advanced Processing Build (APB), Advanced Surveillance Build (ASB), and Advanced Capability Build (ACB) and will in turn share unique improvements developed under this program with the submarine, surface combatants, and surveillance ASW communities. All programs (APB, ASB, and ACB) are managed under a common development process and titled AxB. While the LCS ASW MP will retains its uniqueness, a premium is placed on development of common capabilities and modular architecture technologies to maximize commonality and cost effectiveness.

The Open System Architecture (OSA) and high performance Commercial Off-The-Shelf (COTS) sonar signal processing hardware, provided as an adjunct to the Mission Package Computing Environment (MPCE), will be fielded with the ASW MP and will provide an opportunity to integrate emergent, transformational ASW technological improvements that were previously unachievable. The ASW MP will require periodic upgrades to remain effective well into the 21st century and to pace the threat.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

Software upgrades target capability increases in high interest areas as defined by the Fleet and are captured in campaign analysis. To achieve this, this project will package and deliver incremental upgrades every four years to the ASW MP baseline via an ACB development process by inserting maturing Undersea Warfare (USW) technologies and addressing hardware technology obsolescence.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Anti-Submarine Warfare (ASW) Mission Modules	39.951	23.791	17.268	0.000	17.268
Articles:	-	-	-	-	-
FY 2021 Plans: CONTINUED FORMAL TESTING ON FREEDOM (FRE) VARIANT TO SUPPORT IOT&E - Continued making developmental progress through test and evaluation, leading to system improvement implementations and maturing the ASW MP technology - Conducted acoustic performance testing at Seneca Lake and performed analysis on updated transducer design - Conducted hydrodynamic testing to determine impacts of refined Variable Depth Sonar towed body tail designs -Complete developmental testing on LCS 3, to include Bottom Bounce (BB) and Convergence Zone (CZ) DT events using a submarine asset (target) - Successfully track, engage, detect, and reacquire targets during developmental testing - Prepared Class Design Package Ship Alterations (SHIPALTS) to support the FRE variant ASW Division Ships ACB-19 SOFTWARE WITH TI-20 HARDWARE (ACB 20.19L) - Continued development of the Escort Mission Module (EMM) of ACB 20.19L Sonar Signal Processing System (SSPS) Baseline PERFORMANCE MODELING - Updated acoustic system performance models based on testing to support predictive planning and operational use of the ASW MP - Developed additional hydrodynamic models, including Computational Fluid Dynamic (CFD) models, to incorporate stability improvements based on findings during testing - Used hydrodynamic models to predict performance in straight tow conditions and turns for multiple towed body designs - Used hydrodynamic models to predict impacts to cone angle performance from dive plane modifications HYDRODYNAMIC DESIGN					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Developed hydrodynamic modifications to the towed body including new tail designs - Conducted drogue drag testing and analysis to determine impacts to hydrodynamic performance - Analyzed passive hydrodynamic design modifications in support of fielding DEVELOPMENT OF INTEGRATED LOGISTICS SUPPORT (ILS) - Continued development of ASW MP Logistics products - Provided interim training materials and briefed crew before test events - Used LCS Virtual Training (360-degree) to assist new crew members prior to test events INITIATED INTEGRATION OF ASW MP ON INDEPENDENCE VARIANT (IND) IN PREPARATION FOR FORMAL TESTING - Completed requirements analysis for the Independence variant SHIPALT - Completed the Ship Installation Drawings (SIDs) and Ship Change Documents (SCDs) - Prepared Class Design Package Ship Alterations (SHIPALTS) to support the IND variant ASW Division Ships and future testing					
FY 2022 Base Plans: COMPLETE FORMAL TESTING ON FREEDOM (FRE) VARIANT TO SUPPORT IOT&E - Continue developmental progress through test and evaluation, leading to system improvement implementations and maturing ASW MP Technology - Conduct acoustic performance testing and perform analysis on to refine DART transducer design - Complete Bottom Bounce (BB) and Convergence Zone (CZ) testing on the LCS 3 FRE Variant using submarine test assets (targets) on the West Coast - Successfully detect, track, engage, and reacquire targets during developmental testing - Complete TECHEVAL and IOT&E on LCS 3 in support of IOC in Q3 FY 2022 CONTINUE INTEGRATION AND ANALYSIS EFFORTS FOR ASW MP ON INDEPENDENCE (IND) VARIANT - Conduct ship checks on IND Variant to facilitate development of ASW MP SHIPALT - Complete development of ASW MP SHIPALT for IND Variant in preparation for future MP embarkations - Initiate safety analysis of ASW MP Equipment for the IND Variant - Integrate the Low Rate Initial Production (LRIP) VDS and other components with IND Variant					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
ACB-19 SOFTWARE WITH TI-20 HARDWARE (ACB 20.19L) - Complete development of Escort Mission Module (EMM) ACB 20.19L Sonar Signal Processing System (SSPS) Baseline - Complete Software Qualification Testing (SQT) and certification of ACB 20.19L Sonar Signal Processing System (SSPS) Baseline - Conduct Environmental Qualification Testing (EQT) of the ACB 20.19L Sonar Signal Processing System (SSPS) Baseline - Complete integration and testing of ACB 20.19L Sonar Signal Processing System (SSPS) Baseline against IND Variant combat system (CS) TRAINING - Complete the development of ASW MP operator training materials and course curriculum to support Train to Qualify (T2Q) and Train to Certify (T2C) requirements - Complete development of component and system level modeling and simulation capabilities to enable high fidelity virtual reality training - Conduct vendor training events in support of formal courseware development - Continue development of Common Skills, ASW Skills, and O&M Training to incorporate ASW MP capabilities for the ASW Fleet Training Center in support of Ready For Training (RFT) - Continue to provide initial training to LCS Sailors in support of key test events, as well as temporary vendor training to ensure Sailors are receiving adequate ASW MP operation and maintenance training until formal Navy training is fully established MODELING - Update acoustic system performance models based on testing of the LRIP VDS ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The program remains in testing in FY 2022.					
Accomplishments/Planned Programs Subtotals	39.951	23.791	17.268	0.000	17.268

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

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 1600: *LCS Common Mission Modules Equipment*	38.730	36.323	74.231	-	74.231	-	-	-	-	-	-
• OPN 1602: *LCS ASW Mission Modules*	24.617	38.359	1.565	-	1.565	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The LCS MM Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

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
2.0 ASW MP	Various	PEO IWS 5E : Various	1.500	0.000		0.150	Jan 2021	0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NUWC NPT : Newport RI	2.380	1.600	Nov 2019	1.800	Nov 2020	3.150	Nov 2021	-		3.150	-	-	-
2.0 ASW MP	WR	NIWC : San Diego, CA	0.750	0.000		0.250	Jan 2021	0.000		-		0.000	-	-	-
2.0 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	2.800	0.000		1.500	Dec 2020	0.000		-		0.000	-	-	-
2.0 ASW MP	Sub Allot	PEO IWS 5A : Various	13.800	12.200	Mar 2020	13.294	Mar 2021	6.083	Mar 2022	-		6.083	-	-	-
2.0 ASW MP	C/CPFF	CACI : Washington, DC	0.255	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NSWC DD : Dahlgren, VA	0.225	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	SUPSHIP Bath : Bath, Me	1.550	1.871	Oct 2019	0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	MIPR	NAWC WD : Point Mugu, CA	0.410	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/FFP	Raytheon : Portsmouth, RI	0.000	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/CPFF	Huntington Ingalls Industry : Pascagoula MS	0.000	0.000		2.200	Jan 2021	0.000		-		0.000	-	-	-
		Subtotal	23.670	15.671		19.194		9.233		-		9.233	-	-	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
2.0 ASW MP	WR	NUWC KPT : Keyport, Wa	0.500	0.800	Nov 2019	0.850	Dec 2020	1.050	Dec 2021	-		1.050	-	-	-
		Subtotal	0.500	0.800		0.850		1.050		-		1.050	-	-	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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

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
2.0 ASW MP Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.550	0.550	Oct 2019	0.200	Nov 2020	0.600	Nov 2021	-		0.600	-	-	-
2.0 ASW MP Test and Evaluation	WR	NSWC PHD : Port Hueneme, Ca	1.766	5.730	Dec 2019	0.300	Dec 2020	1.500	Dec 2021	-		1.500	-	-	-
2.0 ASW MP Test and Evaluation	WR	Range Service : Var*	3.154	4.300	Oct 2019	0.000		0.000		-		0.000	-	-	-
2.0 ASW MP Test and Evaluation	WR	NUWC NPT : Newport, RI	5.734	8.400	Dec 2019	0.800	Nov 2020	0.850	Nov 2021	-		0.850	-	-	-
2.0 ASW MP Test and Evaluation	WR	NUWC KPT : Keyport, Wa	2.600	2.500	Nov 2019	0.000		0.000		-		0.000	-	-	-
2.0 ASW MP Test and Evaluation	C/CPFF	Raytheon : Portsmouth, RI	1.400	1.400	Jan 2020	0.500	Dec 2020	1.888	Dec 2021	-		1.888	-	-	-
2.0 ASW MP Test and Evaluation	C/CPFF	Northrop Grumman : Bethpage, NY	0.000	0.000		1.300	Dec 2020	1.500	Dec 2021	-		1.500	-	-	-
		Subtotal	15.204	22.880		3.100		6.338		-		6.338	-	-	N/A

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
2.0 ASW MP	C/CPIF	Booz Allen Hamilton : Washington, DC	0.551	0.600	Jan 2020	0.647	Jan 2021	0.647	Jan 2022	-		0.647	-	-	-
		Subtotal	0.551	0.600		0.647		0.647		-		0.647	-	-	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	39.925	39.951		23.791		17.268		-		17.268	-	-	N/A

Remarks

FY 2018 and prior funding in Project 3129.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

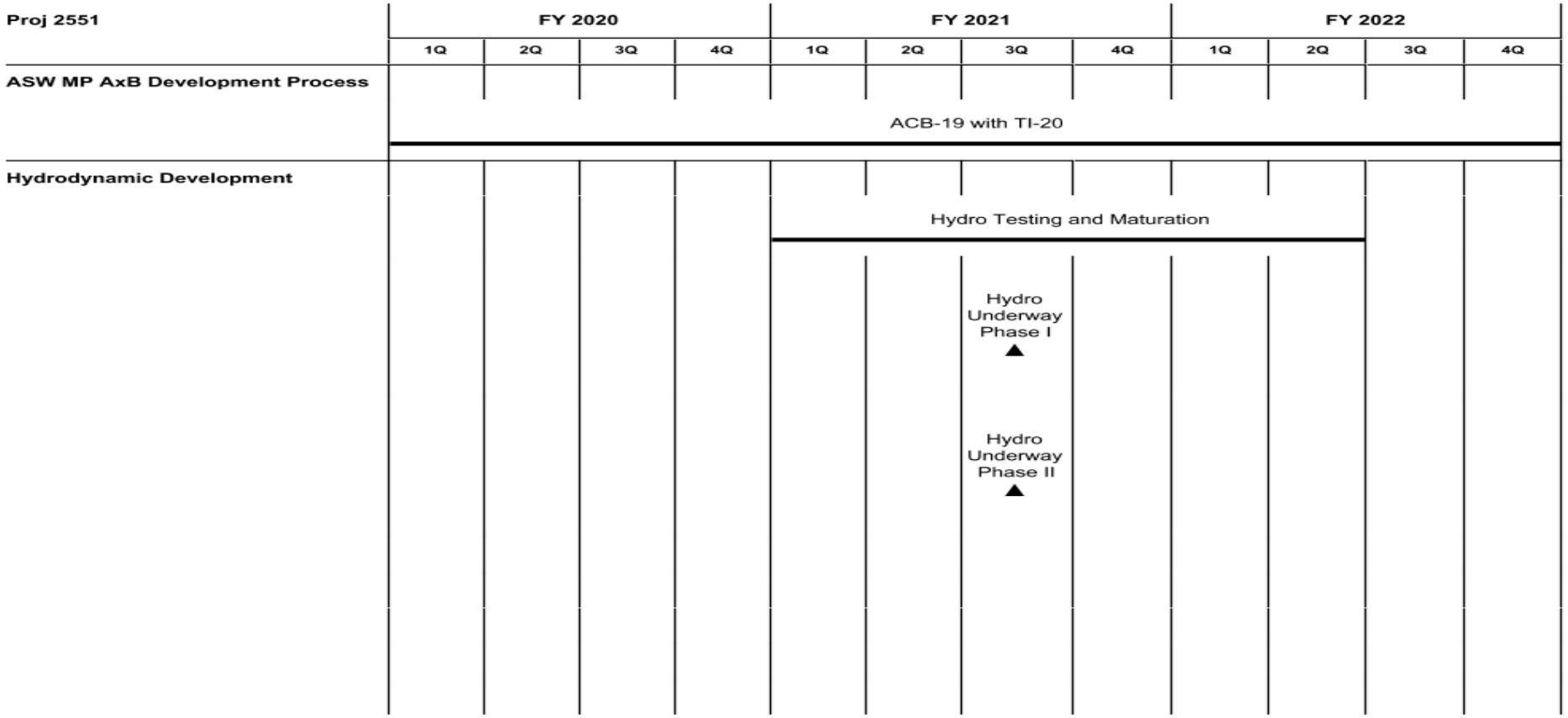

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

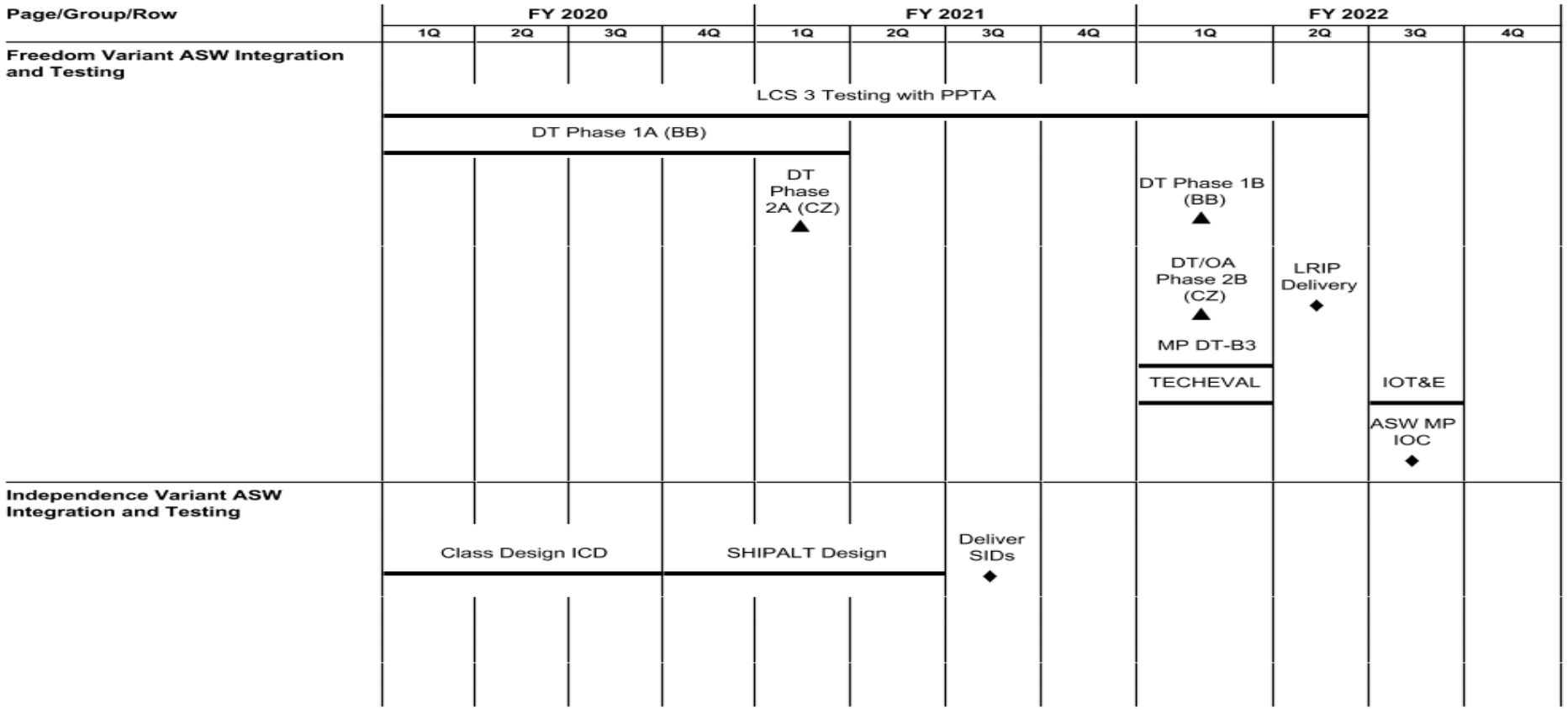

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2551 / *Anti-Submarine Warfare (ASW) Mission Package*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2551				
ASW MP AxB Development Process: ACB-19 with TI-20	1	2020	4	2022
Hydrodynamic Development: Hydro Testing and Maturation	1	2021	2	2022
Hydrodynamic Development: Hydro Underway Phase I	3	2021	3	2021
Hydrodynamic Development: Hydro Underway Phase II	3	2021	3	2021
Page/Group/Row				
Freedom Variant ASW Integration and Testing: LCS 3 Testing with Pre-Production Test Article	1	2020	2	2022
Freedom Variant ASW Integration and Testing: ASW MP DT-B3 Phase 1A	1	2020	1	2021
Freedom Variant ASW Integration and Testing: ASW MP DT-B3 Phase 2A	1	2021	1	2021
Freedom Variant ASW Integration and Testing: ASW MP DT-B3 Phase 1B	1	2022	1	2022
Freedom Variant ASW Integration and Testing: ASW MP DT/OA-B3 Phase 2B	1	2022	1	2022
Freedom Variant ASW Integration and Testing: Production Unit (LRIP) Delivery	2	2022	2	2022
Freedom Variant ASW Integration and Testing: ASW MP DT-B3	1	2022	1	2022
Freedom Variant ASW Integration and Testing: ASW MP DT/IT-C3 TECHEVAL	1	2022	1	2022
Freedom Variant ASW Integration and Testing: ASW MP OT-C3	3	2022	3	2022
Freedom Variant ASW Integration and Testing: ASW MP IOC	3	2022	3	2022
Independence Variant ASW Integration and Testing: Class Design ICD Development	1	2020	3	2020
Independence Variant ASW Integration and Testing: SHIPALT Design Development	4	2020	2	2021
Independence Variant ASW Integration and Testing: Deliver Ship Interface Documents (SIDs) & Specifications	3	2021	3	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 0603596N / *LCS Mission Modules*	Project (Number/Name) 2552 / *Surface Warfare (SUW) Mission Package*	

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
2552: *Surface Warfare (SUW) Mission Package*	10.923	16.870	8.079	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 443

A. Mission Description and Budget Item Justification

The SUW MP increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes and move a force quickly through a choke point or other strategic waterway. The SUW MP is composed of several mission modules including the Gun Mission Module (GMM), the Aviation Module, the Maritime Security Module (MSM), and the Surface-to-Surface Missile Module (SSMM). The GMM is composed of two high velocity 30mm cannons which is augmented by the ship's resident 57mm gun to counter close in to mid-range threats. The Aviation Module uses the embarked MH-60R helicopter with Hellfire missile and the MQ-8B Fire Scout VTUAV for the detection, identification, and classification of surface contacts and to engage long range threats. The MSM supports the embarkation of a Visit, Board, Search, and Seizure (VBSS) team. The SSMM is a self-contained module consisting of 2 Missile Exhaust Containment Structures (MECS), integrated articulating hatch covers, a fire control system, and 12 two-rail MK 210 launchers to support load out and firing of 24 Longbow Hellfire missiles. SSMM provides missile coverage for mid-range threats and small boats.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Surface Warfare (SUW) Mission Modules	16.870	8.079	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans: Conduct Cyber Security Testing on Freedom Variant Complete Combat System Certification in support of deployment on Independence Variant. Certify the Surface-to-Surface Missile Module (SSMM) for deployment on Independence variant. Update Longbow Hellfire Tactical Software based on test findings Incorporate all Independence test findings and finalize all ILS and Training material in support of SSMM fielding and deployments on Independence Variant: 1.) Interim Training for Independence 2.) Combat Systems Operational Sequencing System (CSOSS) manuals 3.) SSMM Operators Manual					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2552 / *Surface Warfare (SUW) Mission Package*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
4.) Technical Manual for MK 210 launcher 5.) SSMM MPAS integration with CMPT ***FY 2022 Base Plans:*** N/A All SUW MP developmental efforts are completed in FY 2021. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** In FY 2021 the program completes all SUW MP developmental efforts and transitions the SUW MP to sustainment.					
Accomplishments/Planned Programs Subtotals	16.870	8.079	0.000	0.000	0.000

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 1600: *LCS Common Mission Module Equipment*	38.730	36.323	74.231	-	74.231	-	-	-	-	-	-
• OPN 1603: *LCS SUW Mission Module*	14.598	24.412	3.395	-	3.395	-	-	-	-	-	-
• WPN 4221: *LCS Module Weapons*	10.998	4.253	2.121	-	2.121	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The LCS MM Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2552 / *Surface Warfare (SUW) Mission Package*

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
3.0 SUW MP	MIPR	JAMS PO : Various	1.350	0.400	Jan 2020	0.500	Feb 2021	0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC DD : Dahlgren, VA	4.653	2.412	Nov 2019	0.400	Nov 2020	0.000		-		0.000	-	-	-
		Subtotal	6.003	2.812		0.900		0.000		-		0.000	-	-	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
3.0 SUW MP	C/CPIF	Northrop Grumman : Bethpage, NY	0.800	0.000		1.800	Nov 2020	0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		2.000	Dec 2020	0.000		-		0.000	-	-	-
		Subtotal	0.800	0.000		3.800		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
3.0 SUW MP CYBER Testing	Sub Allot	NSWC PHD : Port Hueneme, CA	1.970	3.058	Jan 2020	0.750	Dec 2020	0.000		-		0.000	-	-	-
3.0 SUW MP CYBER Testing	WR	NSWC Corona : Corona, CA	0.950	1.000	Jan 2020	0.000		0.000		-		0.000	-	-	-
3.0 SUW MP CYBER Testing	WR	NSWC DD : Dahlgren, VA	0.750	8.900	Jan 2020	2.015	Jan 2021	0.000		-		0.000	-	-	-
3.0 SUW MP CYBER Testing	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.600	Jan 2020	0.200	Dec 2020	0.000		-		0.000	-	-	-
		Subtotal	3.670	13.558		2.965		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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2552 / *Surface Warfare (SUW) Mission Package*

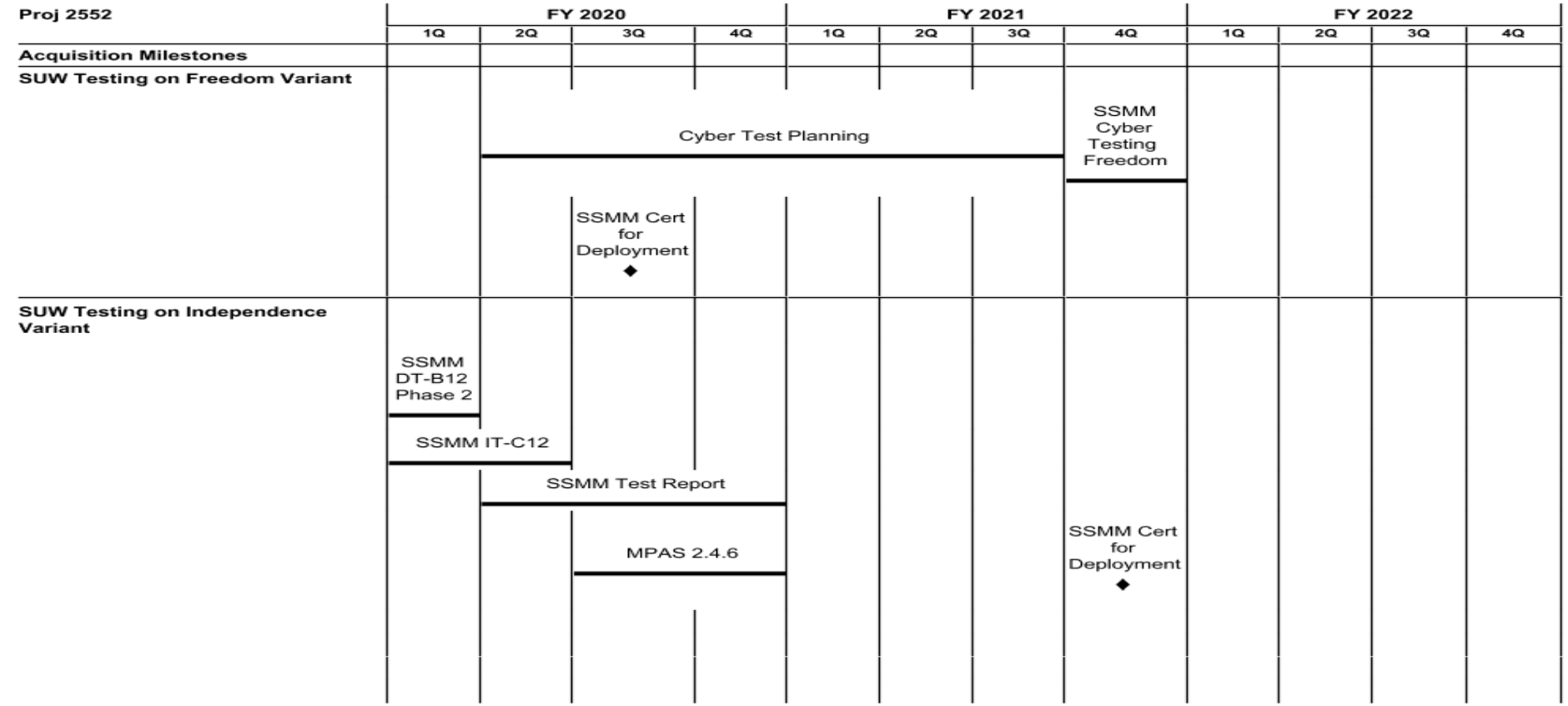
Management Services ($ in Millions)

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
3.0 SUW MP	C/CPIF	Booz Allen Hamilton : Washington, DC	0.450	0.500	Jan 2020	0.414	Jan 2021	0.000		-		0.000	-	-	-
		Subtotal	0.450	0.500		0.414		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	10.923	16.870		8.079		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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2552 / *Surface Warfare (SUW) Mission Package*



2022PB - 0603596N - 2552

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 2552 / *Surface Warfare (SUW) Mission Package*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2552				
SUW Testing on Freedom Variant: SSMM Cyber Test Planning	2	2020	3	2021
SUW Testing on Freedom Variant: Conduct Cyber Security Testing Freedom Variant	4	2021	4	2021
SUW Testing on Freedom Variant: SSMM Certification for Deployment	3	2020	3	2020
SUW Testing on Independence Variant: SSMM DT-B12 Phase II	1	2020	1	2020
SUW Testing on Independence Variant: SSMM IT-C12	1	2020	2	2020
SUW Testing on Independence Variant: Conduct the DAWG and Complete SSMM Test Report	2	2020	4	2020
SUW Testing on Independence Variant: MPAS 2.4.6 Updates to Incorporated Testing Findings	3	2020	4	2020
SUW Testing on Independence Variant: SSMM Certification for Deployment	4	2021	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 0603596N / *LCS Mission Modules*				Project (Number/Name) 3129 / *LCS Mission Package Development*			
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**
3129: *LCS Mission Package Development*	634.389	9.481	8.928	8.738	-	8.738	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 443

A. Mission Description and Budget Item Justification

The LCS MM Common Equipment consists of enabling products required by all MPs to provide common hardware interfaces, computer operating environment, communications systems, aviation interface systems, and portable development & integration test-sets. Common hardware interfaces include definition, installation, and control of mechanical, electrical, and cooling requirements common to all mission packages. The Mission Package Computing Environment (MPCE) provides common services and Operating Environment to support all Mission Package Application Software (MPAS) and Open Architecture Products. The Multi-Vehicle Communications System (MVCS) enables the control and data exchange of simultaneous unmanned mission vehicles and the ship. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. Development and integration test-sets provide a mobile operating environment installed in the Mission Package Portable Control Stations (MPPCSs) to serve as a surrogate ship during mission package development and integration test events at test ranges.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Command, Control, Communication, Computers, Cyber and Intelligence (C5I) and Mission Package Tactical Team Trainers	9.481	8.928	8.738	0.000	8.738
Articles:	-	-	-	-	-
FY 2021 Plans: Mission Package Computing Environment (MPCE) - AN/SYK-31 - Continued engineering of MPCE Tech Refresh; established MPCE v1.10 baseline (early tech refresh) to support MCM MP in advance of completion of MPCE v2.0 - Complete MPCE v1.10 integration and certification for use with each of the Mission Package Application Software (MPAS) baselines. - Update all Logistics documentation to incorporate all MPCE v1.10 changes. - Update the MPCE Training material in support of MPCE v1.10 - Continued tech refresh development in support of MPCE v2.0 - Conduct MPCE v2.0 PDR and CDR. Multi-Vehicle Communication System (MVCS) - AN/SYC-1:					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Complete Tech Refresh development of MVCS v1.2.1 to include updates to Cross Domain Solution to meet National Security Agency (NSA) mandated security requirements. - Conduct shore based, at-sea testing with Knifefish and MCM USV with the new MVCS v1.2.1 baseline. Correct all issues identified during shore based testing. - Integrate the first MVCS 1.2.1 article and support formal shipboard integration and testing with the MCM Mission Package. - Validate the Anti-Jam capabilities between the off-board vehicles and ship. Finalize all MVCS 1.2.1 logistics and provisioning documentation. - Conduct non-destructive Environmental Quality Testing (EQT) on the MVCS 1.2.1 system. - Conduct early subsystem comparative testing on MVCS v1.X (notionally v1.3) components to characterize the potential for future requirements Common Mission Package Trainer (CMPT): - Develop the Technology Refresh of CMPT in alignment with MPCE v1.10. Continue to compile system data to support Reliability and Maintainability (RAM-C) data to support reliability engineering and analysis. Continue FRACAS effort. Provide overarching program management of the LCS Mission Module Program ***FY 2022 Base Plans:*** Mission Package Computing Environment (MPCE) - AN/SYK-31 In support of Technology Refresh of MPCE and certification of version 2.0: - Start integration and testing of MPCE v2.0 with the MCM Mission Package Application Software (MPAS) - Conduct Mission Package integration testing within MPCE v2.0 hardware environment - Complete Environmental Quality Testing - Acquire updated Logistics and Training material - Initiate development of Technical Data Package (TDP) for FY23 Delivery Multi-Vehicle Communications System (MVCS) - AN/SYC-1: Finalize development of MVCS v1.2.1 - Testing with MCM USV and integration of Freedom Variant - Conduct environmental Quality Testing - Investigate requirements for Unmanned Vehicle transition of Common Control Software					

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Investigate system level requirements and explore capability improvement alternatives for MVCS v1.X LCS Common Mission Package Portable Control Station (MPPCS)/Common Mission Package Trainer (CMPT) - Implement the MPCE version 1.10 and 2.0 into MPPCS and CMPT ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding in FY 2022 provides MPCE/MVCS support for the MCM MP testing and with initiation of MVCS v1.3 Tech Refresh development.					
Accomplishments/Planned Programs Subtotals	9.481	8.928	8.738	0.000	8.738

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 1600: *LCS Common Mission Modules Equipment*	38.730	36.323	74.231	-	74.231	-	-	-	-	-	-
• OPN 1601: *LCS MCM Mission Modules*	64.789	189.397	40.630	-	40.630	-	-	-	-	-	-
• OPN 1602: *LCS ASW Mission Modules.*	24.617	38.359	1.565	-	1.565	-	-	-	-	-	-
• OPN 1603: *LCS SUW Mission Modules*	14.598	24.412	3.395	-	3.395	-	-	-	-	-	-
• WPN 4221: *LCS Module Weapons*	10.998	4.253	2.121	-	2.121	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The LCS Mission Module Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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 0603596N / *LCS Mission Modules*	Project (Number/Name) 3129 / *LCS Mission Package Development*	

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
6.1 System Engineering	WR	NSWC PCD : Panama City, FL	0.275	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	WR	NSWC DD : Dahlgren, VA	1.784	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	WR	NAVSEALOGCEN : Norfolk, VA	1.520	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	C/CPFF	Northrop Grumman : Bethpage, NY	14.542	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	WR	NSWC Carderock : Bethesda, MD	2.610	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	WR	NSWC PHD : Port Hueneme, CA	1.568	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	WR	NIWC : San Diego, CA	7.660	0.000		0.000		0.000		-		0.000	-	-	-
6.1 System Engineering	C/CPIF	Booz Allen Hamilton : Washington, DC	0.355	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	Sub Allot	CECOM Bldg 1207 : Various	1.092	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NAWC AD : Patuxent River, MD	1.930	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC DD : Dahlgren, VA	0.203	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC PC : Panama City, FL	0.075	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	Northrop Grumman : Bethpage, NY	1.498	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC Carderock : Bethesda, MD	8.625	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	PMS 501 : Various	1.075	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NIWC : San Diego, CA	1.857	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
6.4 Integration, Assembly, Test and Checkout	WR	NSWC PHD : Port Hueneme, CA	1.312	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	C/CPIF	Booz Allen Hamilton : Washington, DC	0.950	0.000		0.000		0.000		-		0.000	-	-	-
6.4 Integration, Assembly, Test and Checkout	WR	NAVAIR : Lakehurst, NJ	0.200	0.000		0.000		0.000		-		0.000	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	AAC : Uniontown, PA	17.763	2.928	Jan 2020	2.635	Jan 2021	2.647	Dec 2021	-		2.647	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NAWC TSD : Orlando, FL	1.654	0.650	Dec 2019	0.000		0.000		-		0.000	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	Northrop Grumman : Bethpage, NY	3.590	0.892	Jan 2020	0.800	Nov 2020	0.030	Nov 2021	-		0.030	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NSWC PC : Panama City, FL	14.953	1.800	Nov 2019	1.943	Nov 2020	4.345	Nov 2021	-		4.345	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NUWC NPT : Newport, RI	2.624	0.450	Nov 2019	0.205	Dec 2020	0.260	Dec 2021	-		0.260	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPIF	Booz Allen Hamilton : Washington, DC	2.289	0.836	Dec 2019	0.802	Nov 2020	0.000		-		0.000	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NIWC PAC : San Diego, CA	4.418	1.175	Nov 2019	1.058	Jan 2021	0.600	Jan 2022	-		0.600	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NSWC DD : Dahlgren, VA	3.412	0.750	Dec 2019	0.675	Dec 2020	0.000		-		0.000	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	PMW 760 : Various	0.889	0.000		0.000		0.000		-		0.000	-	-	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	Progeny : Manassas, VA	1.730	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	WR	NSWC PC : Panama City, FL	71.297	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	Sub Allot	PMS 406 : Various	42.761	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	Sub Allot	PMS 495 : Various	0.249	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	WR	NSWC PHD : Port Hueneme, CA	2.300	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	C/CPIF	Booz Allen Hamilton : Washington, DC	0.400	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	C/CPFF	Northrop Grumman : Bethpage, NY	1.892	0.000		0.000		0.000		-		0.000	-	-	-
1.0 MCM MP	WR	Various : Various	1.124	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	Sub Allot	PEO IWS5E : Various	41.094	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NUWC NPT : Newport, RI	29.320	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	SSC PAC : San Diego, CA	4.967	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	CDSA Dam Neck : Virginia Beach, VA	11.145	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	10.914	0.000		0.000		0.000		-		0.000	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
2.0 ASW MP	WR	PEO IWS 5A : Various	9.301	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/CPFF	SPA : Washington, DC	1.687	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NSWC DD : Dahlgren, VA	0.871	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NUWC KPT : Keyport, WA	1.095	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NSWC PHD : Port Hueneme, CA	1.550	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/FPIF	Booz Allen Hamilton : Washington, DC	0.500	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	WR	NAWC WD : Point Mugu, CA	5.430	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	C/CPFF	Various : Various	3.757	0.000		0.000		0.000		-		0.000	-	-	-
2.0 ASW MP	Sub Allot	Raytheon : Portsmouth, RI	42.056	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	C/CPFF	JAMS PO : Various	7.980	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NAWC WD : Ridgecrest, CA	7.826	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	C/CPFF	Northrop Grumman : Bethpage, NY	60.524	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC CD : Crane, IN	0.396	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC Corona : Corona, CA	1.695	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC DD : Dahlgren, VA	60.316	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	WR	NSWC PHD : Port Hueneme, CA	30.437	0.000		0.000		0.000		-		0.000	-	-	-
3.0 SUW MP	Sub Allot	PEO IWS 3 : Various	9.819	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	565.156	9.481		8.118		7.882		-		7.882	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
6.5 Training Systems Development	WR	NAWC TSD : Orlando, Fl	0.909	0.000		0.000		0.000		-		0.000	-	-	-
6.5 Training Systems Development	WR	NSWC PHD : Port Hueneme, CA	0.390	0.000		0.000		0.000		-		0.000	-	-	-
6.5 Training Systems Development	C/CPIF	Booz Allen Hamilton : Washington, DC	0.268	0.000		0.000		0.000		-		0.000	-	-	-
6.5 Training Systems Development	C/CPAF	Northrop Grumman : Bethpage, NY	0.575	0.000		0.000		0.000		-		0.000	-	-	-
6.5 Training Systems Development	Sub Allot	Various : Various	3.221	0.000		0.000		0.000		-		0.000	-	-	-
6.5 Training Systems Development	WR	JHU/APL : Laurel, MD	1.479	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	6.842	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
6.3 System Test and Evaluation	WR	NSWC PHD : Port Hueneme, CA	27.963	0.000		0.000		0.000		-		0.000	-	-	-
6.3 System Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	4.944	0.000		0.000		0.000		-		0.000	-	-	-
6.3 System Test and Evaluation	WR	NSWC Corona : Corona, CA	0.500	0.000		0.000		0.000		-		0.000	-	-	-
6.3 System Test and Evaluation	WR	NIWC : San Diego, CA	5.258	0.000		0.000		0.000		-		0.000	-	-	-
6.3 System Test and Evaluation	C/CPIF	Booz Allen Hamilton : Washington, DC	0.750	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	39.415	0.000		0.000		0.000		-		0.000	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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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
6.2 Program Management	C/CPFF	CACI : Fairfax, VA	7.698	0.000		0.000		0.000		-		0.000	-	-	-
6.2 Program Management	C/CPIF	Booz Allen Hamilton : Washington DC	4.695	0.000		0.810	Nov 2020	0.856	Dec 2021	-		0.856	-	-	-
6.2 Program Management	FFRDC	Mitre : McLean, VA	2.679	0.000		0.000		0.000		-		0.000	-	-	-
6.2 Program Management	FFRDC	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.000		-		0.000	-	-	-
6.2 Program Management	C/CPFF	Northrop Grumman : Bethpage, NY	4.977	0.000		0.000		0.000		-		0.000	-	-	-
6.2 Program Management	C/CPFF	NSWC Crane : Various	2.927	0.000		0.000		0.000		-		0.000	-	-	-
		Subtotal	22.976	0.000		0.810		0.856		-		0.856	-	-	N/A

	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
Project Cost Totals	634.389	9.481		8.928		8.738		-		8.738	-	-	N/A

Remarks

Beginning in FY 2019, Mission Package funding is realigned into four (4) projects:

2550 Mine Countermeasures (MCM) Mission Package
2551 Anti-Submarine Warfare (ASW) Mission Package
2552 Surface Warfare (SUW) Mission Package
3129 LCS Mission Package Development

Prior to FY 2019 all Mission Package funding was in Project 3129.

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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

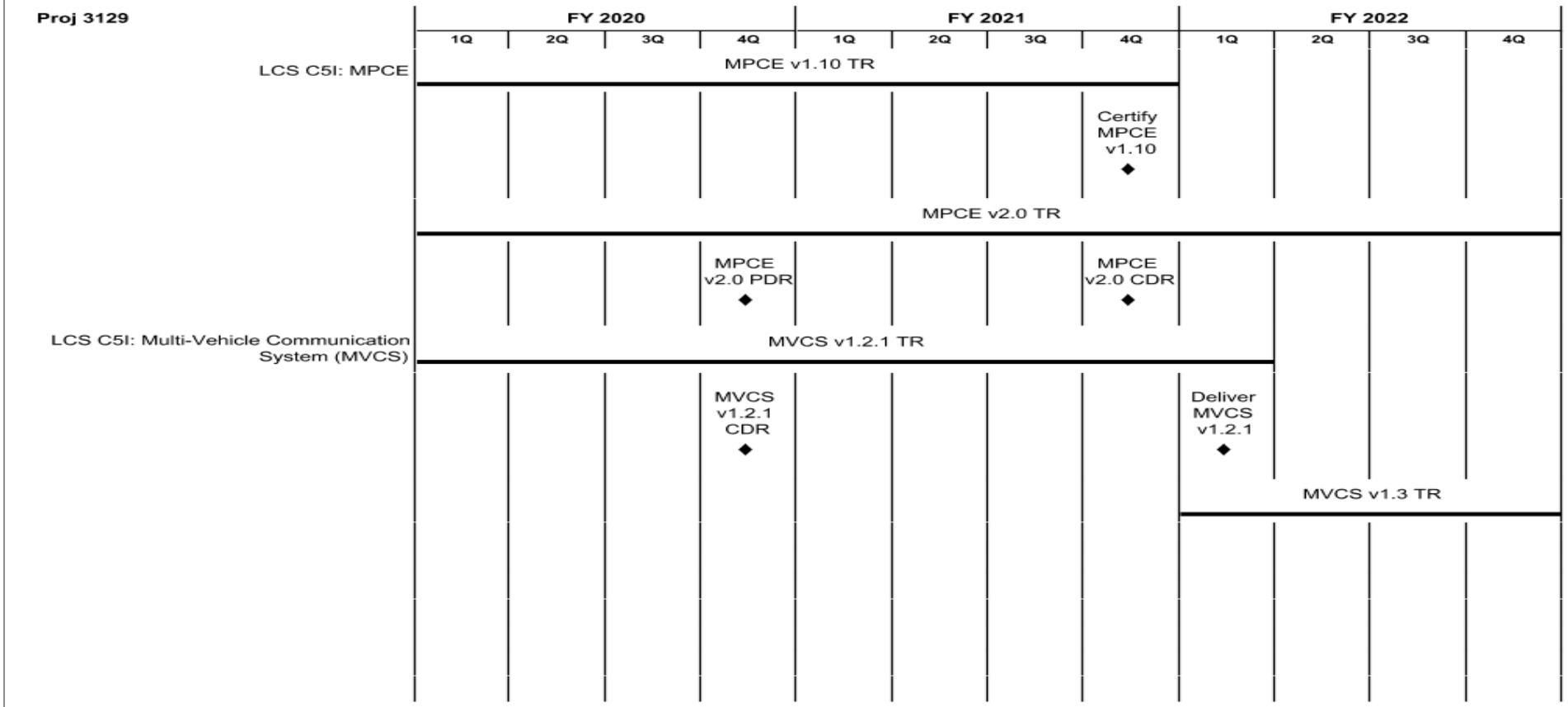

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 3129 / *LCS Mission Package Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3129				
LCS C5I: MPCE: MPCE v1.10 Tech Refresh Development	1	2020	4	2021
LCS C5I: MPCE: Certify MPCE v1.10	4	2021	4	2021
LCS C5I: MPCE: MPCE v2.0 Tech Refresh Development	1	2020	4	2022
LCS C5I: MPCE: Conduct Preliminary Design Review (PDR) for MPCE v2.0	4	2020	4	2020
LCS C5I: MPCE: Conduct Critical Design Review (CDR) for MPCE v2.0	4	2021	4	2021
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS v1.2.1 Tech Refresh Development	1	2020	1	2022
LCS C5I: Multi-Vehicle Communication System (MVCS): Conduct CDR for MVCS v1.2.1	4	2020	4	2020
LCS C5I: Multi-Vehicle Communication System (MVCS): Deliver MVCS v1.2.1	1	2022	1	2022
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS v1.3 Tech Refresh Development	1	2022	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 0603596N / *LCS Mission Modules*	Project (Number/Name) 9999 / *Congressional Adds*	

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
9999: *Congressional Adds*	0.000	0.000	10.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

$10M Congressional Add in FY 2021 for LCS Anti-Submarine Warfare Escort Mission Module Test Ship Installation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021
Congressional Add: LCS Anti-Submarine Warfare Escort Mission Module Test Ship installation	0.000	10.000
FY 2020 Accomplishments: N/A		
FY 2021 Plans: In response to the Congressional Add for LCS ASW EMM Test Ship Installation: INSTALL ASW MP ON A WHITE SHIP AND CONDUCT TESTING - Determine speed and integration requirements in support of hydrodynamic design and testing - Complete integration design of towed body and cabling for White Ship - Work with Variable Depth Sonar (VDS) vendor to integrate towed body and cabling - Conduct multiple test of different towed body and dive plane designs. ASW MP CONSOLE DEVELOPMENT TO SUPPORT ASW MP INSTALLATION ON LCS - Analyze vibration test results for previous ASW MP console design - Design and test a modified ASW MP console to meet all requirements - Assemble consoles and provide for integration - Integrate ASW MP consoles on LCS 21 in support of formal testing.		
Congressional Adds Subtotals	0.000	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 0603596N / *LCS Mission Modules*	Project (Number/Name) 9999 / *Congressional Adds*	

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
Various	C/CPFF	Not Specified : Not Specified	0.000	0.000		10.000	May 2021	0.000		-		0.000	-	-	-
		Subtotal	0.000	0.000		10.000		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	0.000	0.000		10.000		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 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 9999 / *Congressional Adds*

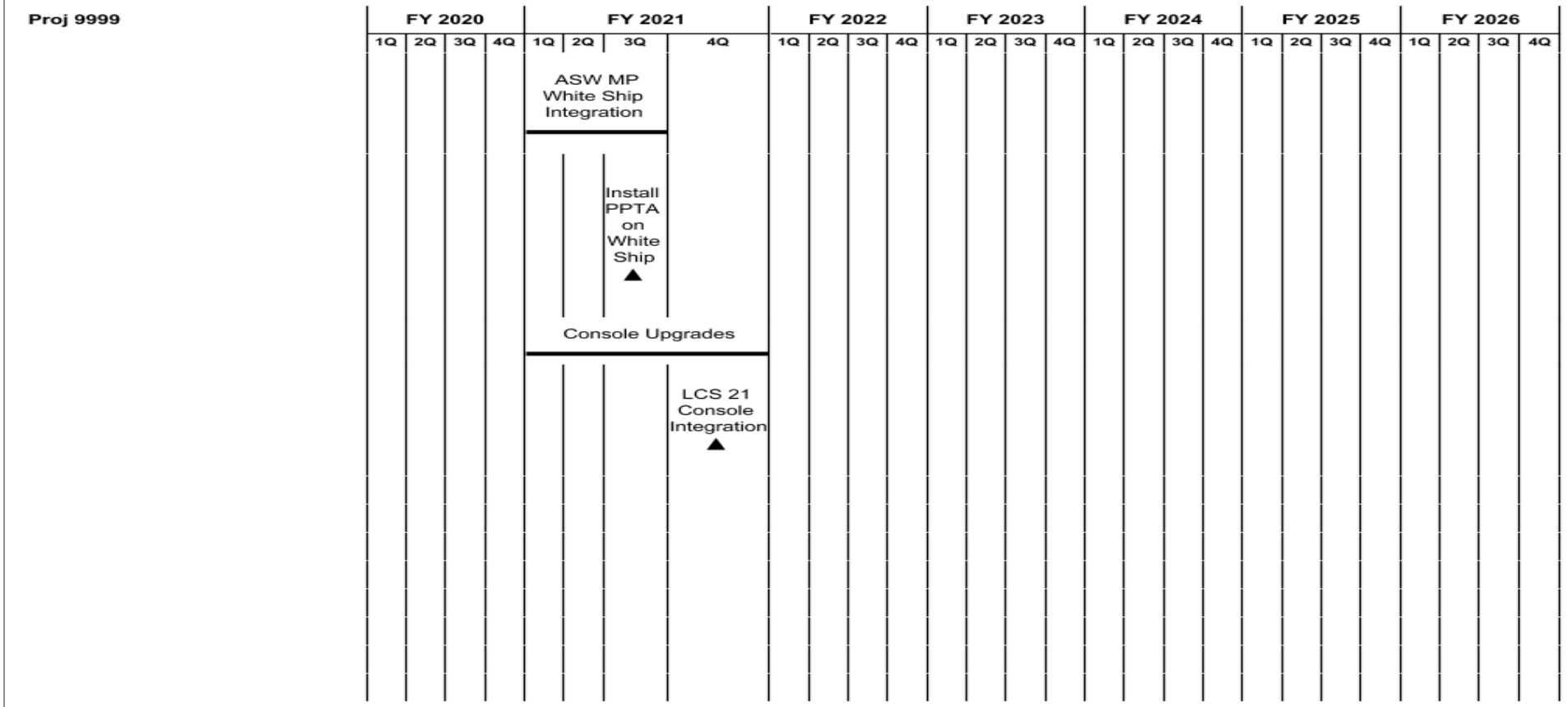

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / *LCS Mission Modules*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
ASW MP White Ship Integration	1	2021	3	2021
Install PPTA on White Ship	3	2021	3	2021
Develop ASW MP Console Upgrades	1	2021	4	2021
Integrate Consoles on LCS 21	4	2021	4	2021