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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,441.401	40.731	82.518	96.444	-	96.444	43.574	78.645	68.725	61.770	Continuing	Continuing
3096: <i>Littoral Combat Ship</i>	1,353.839	29.702	76.969	95.046	-	95.046	42.579	77.703	67.798	60.862	Continuing	Continuing
4506: <i>LCS Training</i>	61.511	1.382	5.549	1.398	-	1.398	0.995	0.942	0.927	0.908	Continuing	Continuing
9999: <i>Congressional Adds</i>	26.051	9.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.698

**Program MDAP/MAIS Code:**  
**Project MDAP/MAIS Code(s):** 374

**A. Mission Description and Budget Item Justification**

The Littoral Combat Ship (LCS) Program Element (PE) provides funds for detailed design, development, construction, issue resolution, certification, integration, and testing of the Littoral Combat Ship (LCS). LCS operates with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including Anti-Submarine Warfare (ASW), Surface Warfare (SUW) and Mine Countermeasures (MCM). LCS also possesses inherent capabilities, regardless of the Mission package installed, including intelligence/surveillance/reconnaissance (ISR), LCS SUW will also include Maritime Interdiction/interception Operations (MIO), Anti-Terrorism/Force Protection (AT/FP), air warfare self-defense, joint littoral mobility and logistic support for movement of personnel and supplies. This relatively small, shallow-draft, high-speed surface combatant complements the U.S. Navy's Surface Fleet by operating in environments where it is impossible or undesirable to employ larger, deeper-draft, multi-mission ships. LCS can deploy independently to overseas littoral regions or remain on station for extended periods of time either with a battle group or through a forward-basing arrangement. LCS will operate with Carrier Strike Groups, Surface Action Groups, or independently as dictated by the mission and environment. Additionally, LCS can operate cooperatively with the U.S. Coast Guard and Allies.

This PE also provides funds for the design, development, engineering, implementation, and testing of the combat system modifications for Lethality and Survivability (L&S) for both LCS variants (Independence and Freedom). The L&S upgrades include the development of a common Combat Management System (CMS) and integration and testing of government furnished systems including the Gun Weapon System (GWS), Electronic Warfare (EW) system and Decoy Launching System (DLS) for both LCS Class Variant ships.

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Navy** **Date:** April 2022

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	42.035	84.924	0.000	-	0.000
Current President's Budget	40.731	82.518	96.444	-	96.444
Total Adjustments	-1.304	-2.406	96.444	-	96.444
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.406			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.161	0.000			
• SBIR/STTR Transfer	-1.144	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.001	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	96.444	-	96.444

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 9999: *Congressional Adds*

Congressional Add: *Defensive Capability Improvements*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	<b>FY 2021</b>	<b>FY 2022</b>
	9.647	0.000
	9.647	0.000
	9.647	0.000

**Change Summary Explanation**

The FY 2023 funding request was reduced by \$1.500 million to account for the availability of prior year execution balances.

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FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3096: <i>Littoral Combat Ship</i>	1,353.839	29.702	76.969	95.046	-	95.046	42.579	77.703	67.798	60.862	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Project MDAP/MAIS Code:** 374

**A. Mission Description and Budget Item Justification**

The RDT&E portion of the LCS Program comprises design and development efforts required to field the LCS Class Ships, including integration with the Mission Packages (MCM, ASW and SUW) activities both pre- and post-delivery. It includes the design and development effort required to support the introduction and deployment of a Flight 0+ baseline (LCS 3/4 and Follow) with incorporation of lessons learned from the design and construction of USS FREEDOM (LCS 1) and USS INDEPENDENCE (LCS 2). Additionally, it includes design, development, issue resolution, certification and testing efforts required to support the design baseline for the six year block buy in FY10-15. This baseline will include lessons learned from the LCS 1 through LCS 4.

The LCS design and development phases include platform design and development, experimentation, ship system design and integration, hull platform testing, development of Technical Data Packages (TDPs), total ship system engineering and integration, combat systems and warfare systems certification, and planning and conduct of system testing. These efforts include procurement of combat and warfare system elements and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing.

The RDT&E portion of LCS funding also comprises formal Developmental and Operational Assessment testing of the LCS Ships and Mission Packages. Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the LCS seaframe designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS program's Flight 0 and Flight 0+ Capabilities Development Documents (CDD). T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core seaframe and the focused missions.

This budget provides funds for the design, development, engineering, implementation, and testing of the combat system modifications for Lethality and Survivability (L&S) for both LCS variants (Independence and Freedom). The L&S upgrades include the development of a common Combat Management System (CMS) and integration and testing of government furnished systems including the Gun Weapon System (GWS), Electronic Warfare (EW) system, and Decoy Launching System (DLS) for both LCS Class Variants (Independence and Freedom) ships.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<b>Title:</b> LCS System-of-Systems Development, Engineering & Experimentation	5.695	0.000	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Provides for LCS program systems engineering in support of Flight 0, Flight 0+, the FY10 Block Buy baseline design, and future procurement baseline design, development, certification, and production					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
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(including ship system design and integration); combat system and C4I design, integration, and test; aviation (manned and unmanned) integration; Mine Countermeasures (MCM), Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) mission package (MP) integration; logistics product development; and various systems engineering activities required to perform risk analyses of new design and production technology concepts.

**FY 2022 Plans:**

N/A

**FY 2023 Base Plans:**

N/A

**FY 2023 OCO Plans:**

N/A

**Title:** LCS Test & Evaluation

**Articles:**

1.024	0.000	0.000	0.000	0.000	0.000
-	-	-	-	-	-

**Description:** Execute formal LCS Developmental Testing and Operational Testing (DT/OT), including Live Fire Test & Evaluation (LFT&E), and procurement of T&E Ordnance. Execute DT and C4I integration and testing; aviation integration (manned and unmanned), Mine Countermeasures (MCM), Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) Mission Package (MP) integration.

**FY 2022 Plans:**

N/A

**FY 2023 Base Plans:**

N/A

**FY 2023 OCO Plans:**

N/A

**Title:** LCS Lethality and Survivability

**Articles:**

22.983	76.969	95.046	0.000	95.046
-	-	-	-	-

**Description:** Provides engineering support to develop a common combat management system, leveraging a common source library, for installation on both LCS variants (Independence and Freedom). The Combat Systems baseline will be compatible with Program of Record (PoR) combat systems replacing Contractor Furnished Equipment (CFE) and integrate Over the Horizon (OTH) missile system. Funding includes logistic

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
product development, Engineering Change Proposals (ECPs), ship structural analysis, development of an integrated test plan and cyber analysis to accomplish Risk Management Framework authorization.					
<b><i>FY 2022 Plans:</i></b> Development of a common Combat Management System (CMS) under a previously awarded contract. The LCS L&S CMS is developed to integrate government furnished equipment to replace the existing contractor furnished equipment and provides enhanced cybersecurity modifications that will be back-fit onboard both in-service LCS variants. The L&S plan upgrades the following systems to Government Furnished Equipment (GFE) resulting in a single combat system baseline with a common CMS: Total Ship Computing Environment, MK20 Electro-Optical Surveillance System, Surface Electronic Warfare Improvement Program, Nulka, MK160 Gun Computer System, Data Links (Independence Variant only), Mode 5 IFF (Independence Variant only) and Global Precision Navigation and Timing System (GPNTS).					
<b><i>FY 2023 Base Plans:</i></b> Verification and testing for the first L&S Phase 1 installations in FY24. Initial L&S Phase 2 studies will be conducted analyzing enhanced fire control radar solution, potential mission package integration to the CMS, improved top-side radars, as well as enhanced lethality in support of Distributed Maritime Operations.					
<b><i>FY 2023 OCO Plans:</i></b> N/A					
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> FY23 funding increase supports completion of LCS L&S development, verification, and testing for first L&S Phase 1 installations in FY24, as well as Phase 2 L&S studies.					
<b>Accomplishments/Planned Programs Subtotals</b>	29.702	76.969	95.046	0.000	95.046

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• SCN/2127: <i>LCS Ship</i>	0.000	44.860	67.801	-	67.801	25.000	0.000	0.000	0.000	0.000	16,867.728
• 1604: <i>LCS In-Service Modernization</i>	42.968	35.183	27.243	-	27.243	116.302	81.824	75.504	156.713	Continuing	Continuing

**Remarks**  
BLI 1604 supports Lethality and Survivability efforts on the LCS Ships

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy Date: April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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**D. Acquisition Strategy**

The LCS program takes an evolutionary approach to acquisition that emphasizes competition as a key to achieving affordability. Initially, two industry teams competed against each other with two distinctly different LCS designs. The decision produced two flights with a vessel from each design: Flight 0 (LCS 1 and LCS 2); and Flight 0+ (LCS 3 and out). The Flight 0+ baseline incorporates lessons learned from the design, construction, and testing of the Flight 0 ships. The Navy conducted a limited competition amongst the existing LCS industry teams or team participants for the award of a contract for the construction of a block buy of up to ten (10) LCS Flight 0+ Class ships, with an objective of competitively awarding a single contract to a single industry team.

By Acquisition Decision Memorandum of December 23, 2010, the USD (AT&L) authorized execution of an alternative acquisition strategy for the FY 2010 through FY 2015 procurement of 20 seaframes through two ten-ship block buy contracts. On December 29, 2010, the Navy awarded two contracts for block buys of up to ten ships, beginning with the award to each contractor of one FY 2010 ship and associated non-recurring engineering, the development of the Technical Data Package (TDP), core class services, and associated data. This was followed by the contractual funding of one ship to each contractor in FY 2011 and two ships each funded in FY 2012 through FY 2014.

On October 17, 2014 USD (AT&L) approved the Navy's plan to procure three ships in FY 2015 and three ships in FY 2016 by modifying the current block buy contracts. The modification to each of the block buy contracts completed the previously approved 20 ship block buy procurement and added options for two FY 2016 ships for a total of 26 LCS ships. The Navy's Acquisition strategy supported the procurement of three LCS ships in FY17, FY18, and FY19.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
L&S Product Development	SS/CPPIF	LM : Moorestown, NJ	0.000	12.850	Nov 2020	50.099	Nov 2021	66.960	Oct 2022	-		66.960	Continuing	Continuing	Continuing
Product Development Summary	Various	Various : Various	479.868	0.000		0.000		0.000		-		0.000	0.000	479.868	-
<b>Subtotal</b>			479.868	12.850		50.099		66.960		-		66.960	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	75.789	1.174	Nov 2020	0.000		0.000		-		0.000	0.000	76.963	-
Government Engineering Support	WR	NSWC/PC : Panama City, FL	27.987	0.000		0.000		0.000		-		0.000	0.000	27.987	-
Government Engineering Support	WR	NUWC/N : Newport, RI	10.424	0.000		0.000		0.000		-		0.000	0.000	10.424	-
Government Engineering Support	WR	NAWC/AD : Pax River, MD	25.062	0.000		0.000		0.000		-		0.000	0.000	25.062	-
Government Engineering Support	WR	NSWC/CR : Crane, IN	17.722	0.000		0.000		0.000		-		0.000	0.000	17.722	-
Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	78.055	1.237	Nov 2020	0.000		0.000		-		0.000	0.000	79.292	-
Government Engineering Support	Various	Government Activities : Various	57.637	0.000		0.000		0.000		-		0.000	0.000	57.637	-
Contractor Engineering Support	C/CPAF	Alion/CSC : Arlington, VA	49.802	0.000		0.000		0.000		-		0.000	0.000	49.802	-
Contractor Engineering Support	C/CPAF	Various : Various	27.389	0.698	Nov 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CD : Bethesda, MD	17.880	1.373	Nov 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	PEO IWS : Various	9.391	0.000		0.000		0.000		-		0.000	0.000	9.391	-

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0603581N / Littoral Combat Ship				3096 / Littoral Combat Ship							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	WR	General Dynamics Bath Iron Works : Bath, ME	0.933	0.000		0.000		0.000		-		0.000	0.000	0.933	-
Condition Based Maintenance	WR	NSWC/PHD : Port Hueneme, CA	5.180	0.000	Nov 2020	0.000		0.000		-		0.000	0.000	5.180	-
Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	2.108	1.542	Nov 2020	0.000		0.000		-		0.000	0.000	3.650	-
Frigate Government Engineering Support	WR	NSWC/CD : Carderock, MD	1.179	0.000		0.000		0.000		-		0.000	0.000	1.179	-
Frigate Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	0.468	0.000		0.000		0.000		-		0.000	0.000	0.468	-
Frigate Contractor Engineering Support	C/CPAF	Alion : Arlington, VA	0.973	0.000		0.000		0.000		-		0.000	0.000	0.973	-
Frigate Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	-
L&S Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	0.000	5.830	Oct 2020	14.309	Oct 2021	15.025	Oct 2022	-		15.025	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/CR : Crane, IN	0.000	0.451	Oct 2020	1.250	Oct 2021	1.275	Oct 2022	-		1.275	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	0.000	0.259	Oct 2020	0.750	Oct 2021	0.765	Oct 2022	-		0.765	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	Government Activities : Various	0.000	0.936	Oct 2020	3.821	Oct 2021	4.011	Oct 2022	-		4.011	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	0.000	0.000		4.363	Oct 2021	4.582	Oct 2022	-		4.582	0.000	8.945	-
L&S Government Engineering Support	WR	NSWC/CD : Carderock, MD	0.000	0.260	Nov 2020	0.268	Oct 2021	0.276	Oct 2022	-		0.276	0.000	0.804	-
<b>Subtotal</b>			408.324	13.760		24.761		25.934		-		25.934	Continuing	Continuing	N/A

**UNCLASSIFIED**

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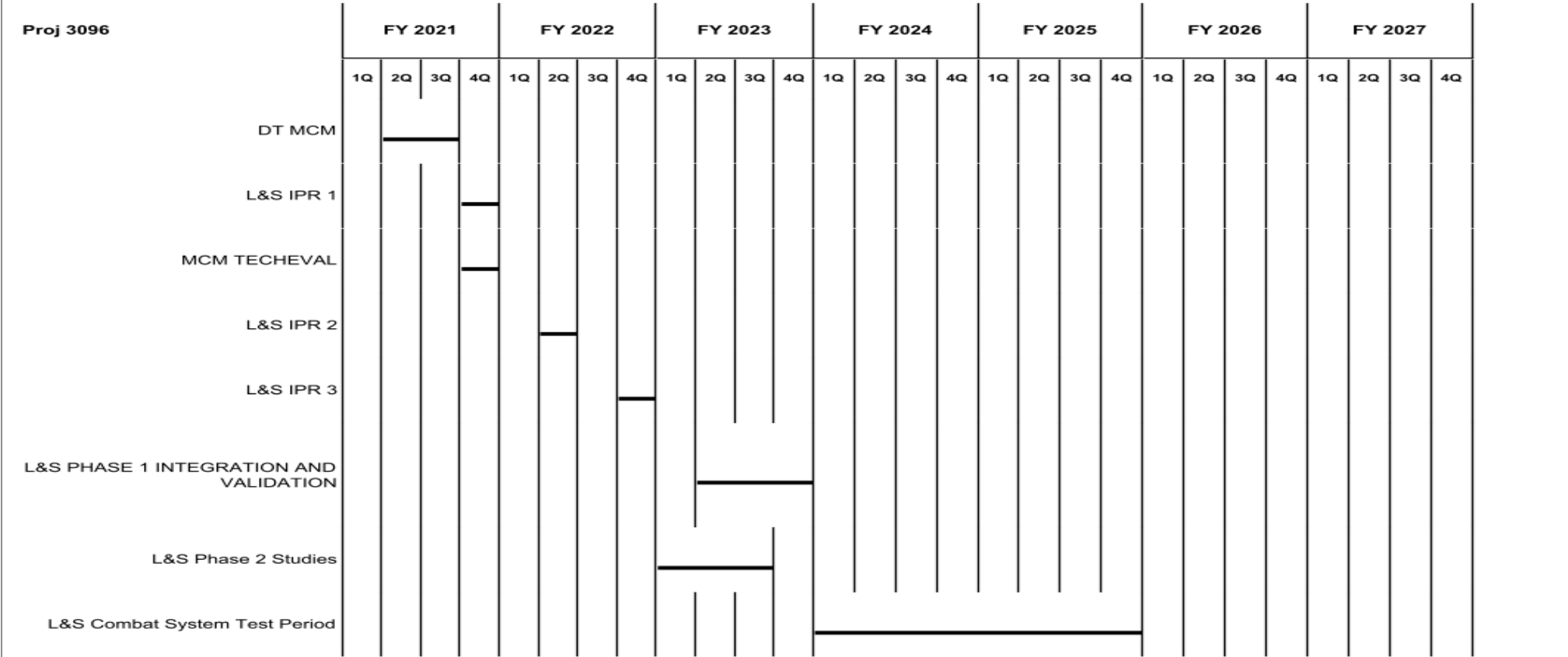
<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test & Evaluation	C/CPAF	Alion/CSC : Arlington, VA	31.844	0.000		0.000		0.000		-		0.000	0.000	31.844	-
Test & Evaluation	WR	NSWC/PHD : Port Hueneme, CA	58.277	0.140	Nov 2020	0.000		0.000		-		0.000	0.000	58.417	-
Test & Evaluation	WR	NSWC/PD : Philadelphia, PA	67.169	0.000		0.000		0.000		-		0.000	0.000	67.169	-
Test & Evaluation	WR	NSWC/PC : Panama City, FL	16.473	0.000		0.000		0.000		-		0.000	0.000	16.473	-
Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	15.650	0.000		0.000		0.000		-		0.000	0.000	15.650	-
Test & Evaluation	WR	NSWC/COR : Corona, CA	18.938	0.202	Jan 2021	0.000		0.000		-		0.000	0.000	19.140	-
Test & Evaluation	WR	Government Activities : Various	71.878	0.341	Nov 2020	0.000		0.000		-		0.000	0.000	72.219	-
Test & Evaluation	C/CPAF	LM/GD/Austal : Various	81.239	0.341	Nov 2020	0.000		0.000		-		0.000	0.000	81.580	-
Test & Evaluation	WR	PEO C4I : Charleston, SC	11.562	0.000		0.000		0.000		-		0.000	0.000	11.562	-
T&E Ordnance/ Ammunition	WR	PEO IWS : Various	22.544	0.000		0.000		0.000		-		0.000	0.000	22.544	-
FSST Support	WR	NAVAIR : Patuxent River, MD	4.487	0.000		0.000		0.000		-		0.000	0.000	4.487	-
Range Support	WR	NAWC/WD : Pt. Mugu, CA	3.468	0.000		0.000		0.000		-		0.000	0.000	3.468	-
Test & Evaluation	WR	NSWC/CD : Bethesda, MD	24.784	0.000		0.000		0.000		-		0.000	0.000	24.784	-
FSST Support	C/BA	National Science Foundation : Arlington, VA	2.671	0.000		0.000		0.000		-		0.000	0.000	2.671	-
FSST Support	C/BA	NAVFAC Atlantic : Virginia Beach, VA	0.759	0.000		0.000		0.000		-		0.000	0.000	0.759	-
Test & Evaluation	C/BA	Naval Research Laboratory : Washington, DC	1.099	0.000		0.000		0.000		-		0.000	0.000	1.099	-



**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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2023PB - 0603581N - 3096

**UNCLASSIFIED**

**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 3096 / <i>Littoral Combat Ship</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Proj 3096</i></b>				
DT MCM: Mine Countermeasures Mission Package Developmental Testing - INDEPENDENCE Variant	2	2021	3	2021
L&S IPR 1: LCS Lethality & Survivability In Progress Review	4	2021	4	2021
MCM TECHEVAL: Mine Countermeasures Mission Package Technical Evaluation - INDEPENDENCE Variant	4	2021	4	2021
L&S IPR 2: LCS Lethality & Survivability In Progress Review	2	2022	2	2022
L&S IPR 3: LCS Lethality & Survivability In Progress Review	4	2022	4	2022
L&S PHASE 1 INTEGRATION AND VALIDATION: Both Variants	2	2023	4	2023
L&S Phase 2 Studies: LCS Lethality & Survivability Combat System Integration Studies for Phase 2 - Both Variants	1	2023	3	2023
L&S Combat System Test Period: LCS Lethality & Survivability Combat System Test Period	1	2024	4	2025

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**Exhibit R-2A, RDT&E Project Justification:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>				<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
4506: <i>LCS Training</i>	61.511	1.382	5.549	1.398	-	1.398	0.995	0.942	0.927	0.908	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**Project MDAP/MAIS Code:** 374

**Note**

\$5M of funding in FY22 supports the Scenario Development Station (SDS) and the procurement of integrated tactical trainers (ITT) and bridge part task trainers (BPTT) which is required to support training for all tactical trainers (3 ITTs and 11 BPTTs per coast). This funding also automates the development and maintenance of navigation (ship driving) and warfare scenarios with each new version of VShip or as combat system baselines are updated. As Fleet training needs increase and additional LCS ships are delivered, SDS funding in FY22 will ensure the LCS ITTs are available to support crew training.

**A. Mission Description and Budget Item Justification**

As a minimally-manned ship, the LCS uses a Train-to-Qualify (T2Q)/Train-to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment. These simulators and blended training solutions focus on tactical, equipment operations, and maintenance training. When completely developed and procured, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q/T2C Key Performance Parameter (KPP) requirements.

Funding will develop upgrades of the Surface Training Advanced Virtual Environment (STAVE) courseware and associated simulators to achieve the training objectives. Additionally, after fielding more of the systems and courseware, out-year funding will be utilized to upgrade training to maintain conformity with LCS configurations and approved operational technical manuals and procedures, as well as test and evaluate training devices to verify compliance with requirements.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<b>Title:</b> LCS Total System Training Architecture	1.382	5.549	1.398	0.000	1.398
<b>Articles:</b>	-	-	-	-	-
<b>FY 2022 Plans:</b>					
FY22 funding supports the development of additional Surface Training Advanced Virtual Environment (STAVE) courseware and simulators to achieve training objectives. This funding also provides program management oversight while the LCS engineering plant technical (EPT-15) course is developed and delivered.					
<b>FY 2023 Base Plans:</b>					
FY23 funding supports the development and implementation of a Scenario Development Tool that automates scenarios between trainers and minimizes and/or removes errors of manual scenario development. This tool will be used with the Surface Training Advanced Virtual Environment (STAVE) courseware and simulators to					

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**Exhibit R-2A, RDT&E Project Justification:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
achieve training objectives. In addition, this funding will provide program management oversight for Scenario Development Tool/courseware contracts under execution.  <b>FY 2023 OCO Plans:</b> N/A  <b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased in FY23 since \$5M of funding in FY22 supported the SDS and the procurement of the ITTs and BPTTs.					
<b>Accomplishments/Planned Programs Subtotals</b>	1.382	5.549	1.398	0.000	1.398

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/5664: <i>Surface Training Equipment</i>	168.730	127.814	191.078	-	191.078	177.927	91.454	161.269	159.902	Continuing	Continuing

**Remarks**  
PEO USC funding accounts for only a portion of the OPN 5664 line:  
FY21 \$4.076, FY22 \$ 4.890, FY23 \$45.680

**D. Acquisition Strategy**  
Per the combined LCS Navy Training System Plan (NTSP), the LCS crew training concept will meet Train to Qualify (T2Q) and Train to Certify (T2C) requirements incrementally, with expected completion in FY25. In the interim, individual qualifications for LCS crew members will be accomplished through a combination of vendor training, existing Navy training, new LCS courses and trainers that are presently online, and Under Instruction (U/I) time aboard LCS ships, prior to reporting for duty. Shore-based training requirements cannot be fully met with the interim LCS training strategy. Full realization will be achieved with the completed standup of the San Diego and Mayport, LCS Training Facilities (LTF), which include the Integrated Tactical Trainers, Bridge, Readiness Control Officer (RCO), Combat Systems and Mission Package Training System (MPTS) part-task trainers, the Common Mission Package Trainer (CMPT), Mission Bay Trainer and Virtual Reality Labs to support the Train to Qualify operations and maintenance pipeline courses.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Deck/Mission Bay Courseware	C/FFP	Cubic : Orlando, FL	2.028	0.225	Nov 2020	0.225	Nov 2021	0.000		-		0.000	0.000	2.478	-
Combat Systems Courseware	C/FFP	Cubic : Orlando, FL	28.326	0.225	Nov 2020	0.000		0.155	Nov 2022	-		0.155	7.800	36.506	-
Eng. Training Courseware	C/FFP	Cubic : Orlando, FL	1.092	0.000		0.920	Nov 2021	1.092	Nov 2022	-		1.092	4.906	8.010	-
Training Development - Support	WR	NAWC/TSD : Orlando, FL	11.963	0.330	Oct 2020	0.407	Oct 2021	0.151	Oct 2022	-		0.151	Continuing	Continuing	Continuing
VTUAV/MH60	C/FFP	TBD : TBD	0.178	0.186	Nov 2020	0.000		0.000		-		0.000	6.270	6.634	-
Mission Bay Trainer	C/CPAF	Cubic : Orlando, FL	1.523	0.000		0.000		0.000		-		0.000	0.000	1.523	-
ITT/BPTT SDS	WR	NAWC/TSD : Orlando, FL	0.000	0.000		3.997	Oct 2021	0.000		-		0.000	0.000	3.997	-
<b>Subtotal</b>			45.110	0.966		5.549		1.398		-		1.398	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Human Systems Integration	WR	NSWC, DD : Dahlgren Virginia	0.964	0.065	Nov 2020	0.000	Nov 2021	0.000		-		0.000	0.000	1.029	-
Information Assurance	WR	NSWC, DN : Dam Neck, VA	4.414	0.000		0.000		0.000		-		0.000	0.000	4.414	-
Training ISEA	WR	NSWC/PHD : Port Huenum, CA	1.684	0.120	Nov 2020	0.000	Nov 2021	0.000		-		0.000	0.000	1.804	-
Warfare Center SME/ NAVFAC	WR	VARIOUS : VARIOUS	2.847	0.108	Nov 2020	0.000	Nov 2021	0.000		-		0.000	0.000	2.955	-
<b>Subtotal</b>			9.909	0.293		0.000		0.000		-		0.000	0.000	10.202	N/A

<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	C/CPAF	Various : Various	6.492	0.123	Nov 2020	0.000	Nov 2021	0.000		-		0.000	0.000	6.615	-



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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>
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Proj 4506	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Combat System Courseware Development																																
<b>Surface Training Advanced Virtual Environment (STAVE)</b>																																
	DECK STAVE Development																															
	Engineering Training Courseware Development																															

2023OSD - 0603581N - 4506

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Proj 4506</i></b>				
Surface Training Advanced Virtual Environment (STAVE): DECK STAVE - Development	1	2021	2	2025
Surface Training Advanced Virtual Environment (STAVE): Engineering Training Courseware Development	1	2021	4	2026

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Navy										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>				<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
9999: <i>Congressional Adds</i>	26.051	9.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.698
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Congressional Add funding will be used to develop Surface Training Advanced Virtual Environment (STAVE) courseware (previously titled Immersive Virtual Ship Environment (IVSE)), and associated simulators to achieve the training objectives. Funding will continue the courseware development efforts of the LCS STAVE Deck Operations (both variants FREEDOM / INDEPENDENCE), and LCS STAVE Combat Systems Trouble Shooting Courseware (both variants FREEDOM / INDEPENDENCE).

FY21 Congressional add funds procurement of a Ceros 200 Fire Control Radar test asset, cyber, and systems engineering in analyzing for Littoral Combat Ship (LCS) Lethality and Survivability.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2021</b>	<b>FY 2022</b>
<b>Congressional Add:</b> Defensive Capability Improvements	9.647	0.000
<b>FY 2021 Accomplishments:</b> Completion of CEROS 200 container hardware procurement.		
<b>FY 2022 Plans:</b> Land-based demonstration, analysis, and technical data transfer to government to support potential future shipboard systems integration.		
<b>Congressional Adds Subtotals</b>	9.647	0.000

**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**D. Acquisition Strategy**

N/A



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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Navy** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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Proj 9999	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
<b>LCS Surface Training Advanced Virtual Environment (STAVE)</b>																												
<b>LCS STAVE Congressional Add</b>																												
<b>LCS STAVE Deck Operations Development</b>																												
<b>LCS STAVE Combat Systems Trouble Shooting Courseware Development</b>																												
<b>Integrated Fire Control Land Based Test Asset</b>																												

2023PB - 0603581N - 9999

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Navy **Date:** April 2022

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / <i>Littoral Combat Ship</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Proj 9999</i></b>				
Integrated Fire Control Land Based Test Asset: Integrated Fire Control Land Based Test Asset	1	2021	4	2022