

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603581N I (U)LITTORAL COMBAT SHIP							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	1,338.875	49.308	37.997	9.934	-	9.934	34.581	81.035	115.770	75.657	Continuing	Continuing
3096: Littoral Combat Ship	1,308.674	20.215	12.220	8.781	-	8.781	31.833	80.142	114.855	74.724	Continuing	Continuing
4506: LCS Training	30.201	19.442	15.777	1.153	-	1.153	2.748	0.893	0.915	0.933	Continuing	Continuing
9999: Congressional Adds	0.000	9.651	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.651
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 374												
Note The FY 2020 funding request was reduced by \$2.500 million to account for the availability of prior year execution balances.												
A. Mission Description and Budget Item Justification This 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.  Beginning in FY 2021, 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 the LCS Class. 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**

<b>Exhibit R-2, RDT&amp;E Budget Item Justification: PB 2020 Navy</b>	<b>Date:</b> March 2019
---	-------------------------

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603581N I (U)LITTORAL COMBAT SHIP
---	---

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
Previous President's Budget	40.991	27.997	12.577	-	12.577
Current President's Budget	49.308	37.997	9.934	-	9.934
Total Adjustments	8.317	10.000	-2.643	-	-2.643
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.683	0.000			
• Program Adjustments	0.000	0.000	-2.500	-	-2.500
• Rate/Misc Adjustments	0.000	0.000	-0.143	-	-0.143
• Congressional Add Adjustments	10.000	-	-	-	-

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

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

Congressional Add: *LCS Training Courseware*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

<b>FY 2018</b>	<b>FY 2019</b>
9.651	10.000
9.651	10.000
9.651	10.000

**Change Summary Explanation**

In FY18, \$10.0M Congressional Add increase for LCS Immersive Virtual Shipboard Environment (IVSE) courseware and a \$1.683M reduction to support efforts for Small Business Innovation Research (SBIR). FY19 funding includes \$10.0M Congressional Add for LCS Training Courseware. In FY20, the funding request was reduced by \$2.500M to account for the availability of prior year execution balances and \$0.143M due to Working Capital Fund (WCF) rate adjustments.

# UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 3096 / Littoral Combat Ship			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3096: Littoral Combat Ship	1,308.674	20.215	12.220	8.781	-	8.781	31.833	80.142	114.855	74.724	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 374												

## Note

The FY 2020 funding request was reduced by \$1.500 million to account for the availability of prior year execution balances.

## 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.

Beginning in FY 2021, this budget provides funds for the design, development, engineering, implementation, and testing of the combat system modifications for Lethality and Survivability (L&S) for the LCS Class. 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.

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

	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
<b>Title:</b> LCS System-of-Systems Development, Engineering & Experimentation	14.583	9.792	6.697	0.000	6.697

## UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP	Project (Number/Name) 3096 / Littoral Combat Ship			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:		-	-	-	-	-
<p><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 (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.</p> <p><b>FY 2019 Plans:</b> Provide systems engineering support for Surface to Surface Mission Module (SSMM) TECHEVAL and IOT&amp;E on the FREEDOM Variant. Provide systems engineering support and complete VTUAV Dynamic Interface testing on the FREEDOM Variant. Provide systems engineering support for Anti-Submarine Warfare (ASW) DT on the Freedom Variant. Provide systems engineering support for the Assessment and Identification of Mine Susceptibility (AIMS), Advanced Mine Simulation System (AMISS) on the FREEDOM and INDEPENDENCE Variant Ships. Provide systems engineering support for the Advanced Degaussing System Calibration (ADG) on the FREEDOM Variant.</p> <p><b>FY 2020 Base Plans:</b> Provide systems engineering support for ASW DT on the INDEPENDENCE Variant. Provide systems engineering support for ASW DT, TECHEVAL and IOT&amp;E Mission Package on the FREEDOM Variant.</p> <p><b>FY 2020 OCO Plans:</b> N/A</p> <p><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> Decrease is due to reduced LCS Test Program in FY20.</p>						
Title: LCS Test & Evaluation		5.632	2.428	2.084	0.000	2.084
Articles:		-	-	-	-	-
<p><b>Description:</b> Execute formal LCS Developmental Testing and Operational Testing (DT/OT), including Live Fire Test &amp; Evaluation (LFT&amp;E), and procurement of T&amp;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.</p> <p><b>FY 2019 Plans:</b></p>						

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy				<b>Date:</b> March 2019							
<b>Appropriation/Budget Activity</b> 1319 / 4		<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP		<b>Project (Number/Name)</b> 3096 / Littoral Combat Ship							
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											
		<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>					
<p>Complete LCS Final Survivability Assessment Report (FSAR). Complete ADST in support of the PRA on the INDEPENDENCE Variant. Complete SUW DT Phase I on the FREEDOM Variant. Conduct Advanced Degaussing (ADG) on the FREEDOM Variant. Conduct Assessment and Identification of Mine Susceptibility (AIMS) testing Advanced Mine Simulation System (AMISS) testing on the FREEDOM Variant. Conduct Vertical Take-off and Landing Unmanned Aerial Vehicle (VTUAV) Dynamic Interface testing on the FREEDOM Variant. Complete SUW Surface to Surface Mission Module (SSMM MP) Developmental Testing (DT), Technical Evaluation (TECHEVAL), and Initial Operational Test &amp; Evaluation (IOT&amp;E) on the FREEDOM Variant. Commence Anti-Submarine Warfare (ASW) DT on the FREEDOM Variant.</p> <p><b>FY 2020 Base Plans:</b> Complete ASW DT on the INDEPENDENCE Variant. Conduct ASW DT Phase II, TECHEVAL, and IOT&amp;E on the FREEDOM Variant. Complete planning for MCM DT on the INDEPENDENCE Variant. Begin planning MCM DT Phase I on the FREEDOM Variant.</p> <p><b>FY 2020 OCO Plans:</b> N/A</p> <p><b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> No significant change from FY19 to FY20.</p>											
<b>Accomplishments/Planned Programs Subtotals</b>		20.215	12.220	8.781	0.000	8.781					
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• SCN/2127: Littoral Combat Ship (LCS)	1,593.824	1,674.428	14.000	-	14.000	24.860	0.000	41.530	0.000	0.000	16,799.399
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
<p>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.</p>											

# UNCLASSIFIED

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy		<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP	<b>Project (Number/Name)</b> 3096 / Littoral Combat Ship
<p>By Acquisition Decision Memorandum of December 23, 2010, the USD (AT&amp;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.</p> <p>On October 17, 2014 USD(AT&amp;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.</p> <p><b><u>E. Performance Metrics</u></b></p> <p>The LCS Program achieved Milestone A and Program Initiation in May 2004 and Milestone B in February 2011. The LCS program conducts annual Defense Acquisition Board In-Process Reviews (DAB IPRs). The first Seaframe and Mission Module integrated program DAB IPR was conducted in January 2013 and is held in September thereafter.</p>		

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 3096 / Littoral Combat Ship					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Product Development Summary	Various	Various : Various	479.868	0.000		0.000		0.000		-		0.000	0.000	479.868	-
Subtotal			479.868	0.000		0.000		0.000		-		0.000	0.000	479.868	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	70.250	2.023	Feb 2018	1.460	Nov 2018	1.056	Nov 2019	-		1.056	Continuing	Continuing	Continuing
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	10.039	0.153	Nov 2017	0.110	Nov 2018	0.122	Nov 2019	-		0.122	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	73.126	1.906	Feb 2018	1.375	Nov 2018	1.105	Nov 2019	-		1.105	Continuing	Continuing	Continuing
Government Engineering Support	Various	Government Activities : Various	52.775	2.000	Feb 2018	1.443	Nov 2018	1.180	Nov 2019	-		1.180	Continuing	Continuing	Continuing
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	22.815	1.863	Feb 2018	1.344	Mar 2019	1.070	Mar 2020	-		1.070	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CD : Bethesda, MD	10.113	4.592	Jul 2018	2.131	Feb 2019	1.044	Nov 2019	-		1.044	Continuing	Continuing	Continuing
Government Engineering Support	WR	PEO IWS : Various	3.388	1.987	Jul 2018	1.886	Dec 2018	1.072	Mar 2020	-		1.072	Continuing	Continuing	Continuing

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 3096 / Littoral Combat Ship					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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		0.000		0.000		-		0.000	0.000	5.180	-
Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	0.858	0.059	Nov 2017	0.043	Nov 2018	0.048	Nov 2019	-		0.048	0.000	1.008	-
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	-
Subtotal			373.015	14.583		9.792		6.697		-		6.697	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
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	57.556	0.416	Jul 2018	0.179	Nov 2018	0.079	Nov 2019	-		0.079	0.000	58.230	-
Test & Evaluation	WR	NSWC/PD : Philadelphia, PA	66.344	0.825	Nov 2017	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	14.893	0.000		0.757	Nov 2018	0.335	Nov 2019	-		0.335	0.000	15.985	-



**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 3096 / Littoral Combat Ship					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Test & Evaluation	WR	NSWC/COR : Corona, CA	18.186	0.245	Nov 2017	0.106	Nov 2018	0.401	Nov 2019	-		0.401	0.000	18.938	-
Test & Evaluation	WR	Government Activities : Various	71.066	0.500	Nov 2017	0.216	Mar 2019	0.096	Mar 2020	-		0.096	0.000	71.878	-
Test & Evaluation	C/CPAF	LM/GD/Austal : Various	80.176	0.890	Jan 2018	0.000		0.173	Mar 2020	-		0.173	0.000	81.239	-
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	19.858	2.756	Feb 2018	1.170	Feb 2019	1.000	Nov 2019	-		1.000	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	-
Subtotal			422.986	5.632		2.428		2.084		-		2.084	0.000	433.130	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Program Management Support- SEAPORT	C/CPAF	Alion/CSC : Arlington, VA	20.593	0.000		0.000		0.000		-		0.000	0.000	20.593	-

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2020 Navy</b>													<b>Date:</b> March 2019		
<b>Appropriation/Budget Activity</b> 1319 / 4							<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP					<b>Project (Number/Name)</b> 3096 / Littoral Combat Ship			

  

<b>Management Services (\$ in Millions)</b>				<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management Support	Various	Various : Various	12.212	0.000		0.000		0.000		-		0.000	0.000	12.212	-
<b>Subtotal</b>			32.805	0.000		0.000		0.000		-		0.000	0.000	32.805	N/A

  

	<b>Prior Years</b>	<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	1,308.674	20.215		12.220		8.781		-		8.781	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Navy			<b>Date:</b> March 2019		
<b>Appropriation/Budget Activity</b> 1319 / 4		<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP			<b>Project (Number/Name)</b> 3096 / Littoral Combat Ship

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Proj 3096</b>																												
LCS FSAR: LCS Final Survivability Assessment Report																												
ADT: Air Defense Testing for Self Defense Test Ship																												
ADST in Support of PRA Testing: Air Defense Seaframe Testing - INDEPENDENCE Variant																												
FSST Post Availability Report - LCS 6: Post Availability Report - INDEPENDENCE Variant																												
FSST Post Availability Report - LCS 5: Post Availability Report - FREEDOM Variant																												
DT SUW: Surface Warfare Developmental Test - Phase I - FREEDOM Variant																												
IOT&E VTUAV: Vertical Take-off and Landing Unmanned Aerial Vehicle Initial Operational Test and Evaluation - INDEPENDENCE Variant																												
TECHEVAL SUW: Surface Warfare - Surface to Surface Mission Package (SSMM MP) Technical Evaluation - FREEDOM Variant																												
ADG Degaussing: Advanced Degaussing System - FREEDOM Variant																												
AIMS Testing: Assessment and Identification of Mine Susceptibility - FREEDOM Variant																												
AMISS Testing: Advanced Mine Simulation System - FREEDOM Variant																												
VTUAV Dynamic Interface Testing: Vertical Take-off and Landing Unmanned Aerial																												

## UNCLASSIFIED

Exhibit R-4, RDT&amp;E Schedule Profile: PB 2020 Navy

Date: March 2019

## Appropriation/Budget Activity

1319 / 4

## R-1 Program Element (Number/Name)

PE 0603581N / (U)LITTORAL COMBAT SHIP

## Project (Number/Name)

3096 / Littoral Combat Ship

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Vehicle Dynamic Interface Testing - FREEDOM Variant																												
IOT&E SUW: Surface Warfare - Surface to Surface Mission Package (SSMM MP) Initial Operational Test and Evaluation - FREEDOM Variant																												
ASW DT: Anti-Submarine Warfare Developmental Test - FREEDOM Variant																												
ASW TECHEVAL: Anti-Submarine Warfare Technical Evaluation - FREEDOM Variant																												
ASW IOT&E: Anti-Submarine Warfare Mission Package Initial Operational Test and Evaluation - FREEDOM Variant																												
ASW DT: Anti-Submarine Warfare Developmental Test - INDEPENDENCE Variant																												
DT MCM: Mine Countermeasures Mission Package Developmental Testing - INDEPENDENCE Variant																												
L&S IPR 1: LCS Lethality & Survivability In Progress Review																												
MCM TECHEVAL: Mine Countermeasures Mission Package Technical Evaluation - INDEPENDENCE Variant																												
MCM IOT&E: Mine Countermeasures Mission Package Initial Operational Test and Evaluation - INDEPENDENCE Variant																												
L&S IPR 2: LCS Lethality & Survivability In Progress Review																												

**UNCLASSIFIED**

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy															Date: March 2019																						
Appropriation/Budget Activity										R-1 Program Element (Number/Name)										Project (Number/Name)																	
1319 / 4										PE 0603581N / (U)LITTORAL COMBAT SHIP										3096 / Littoral Combat Ship																	
										FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MCM DT: Modular Mine Countermeasure Mission Package Developmental Testing - FREEDOM Variant																																					
MCM IOT&E: Modular Mine Countermeasure Mission Package Initial Operational Test and Evaluation - FREEDOM Variant																																					
L&S IPR 3: LCS Lethality & Survivability In Progress Review																																					
L&S Combat System Certification: LCS Lethality & Survivability Combat System Certification																																					
L&S Combat System Test Period: LCS Lethality & Survivability Combat System Test Period																																					

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Navy			<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP	<b>Project (Number/Name)</b> 3096 / Littoral Combat Ship	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3096</b>				
LCS FSAR: LCS Final Survivability Assessment Report	1	2018	2	2019
ADT: Air Defense Testing for Self Defense Test Ship	1	2018	1	2019
ADST in Support of PRA Testing: Air Defense Seaframe Testing - INDEPENDENCE Variant	1	2018	3	2019
FSST Post Availability Report - LCS 6: Post Availability Report - INDEPENDENCE Variant	1	2018	3	2018
FSST Post Availability Report - LCS 5: Post Availability Report - FREEDOM Variant	1	2018	3	2018
DT SUW: Surface Warfare Developmental Test - Phase I - FREEDOM Variant	3	2018	1	2019
IOT&E VTUAV: Vertical Take-off and Landing Unmanned Aerial Vehicle Initial Operational Test and Evaluation - INDEPENDENCE Variant	3	2018	4	2018
TECHEVAL SUW: Surface Warfare - Surface to Surface Mission Package (SSMM MP) Technical Evaluation - FREEDOM Variant	1	2019	1	2019
ADG Degaussing: Advanced Degaussing System - FREEDOM Variant	1	2019	1	2019
AIMS Testing: Assessment and Identification of Mine Susceptibility - FREEDOM Variant	1	2019	1	2019
AMISS Testing: Advanced Mine Simulation System - FREEDOM Variant	1	2019	1	2019
VTUAV Dynamic Interface Testing: Vertical Take-off and Landing Unmanned Aerial Vehicle Dynamic Interface Testing - FREEDOM Variant	1	2019	1	2019
IOT&E SUW: Surface Warfare - Surface to Surface Mission Package (SSMM MP) Initial Operational Test and Evaluation - FREEDOM Variant	1	2019	2	2019
ASW DT: Anti-Submarine Warfare Developmental Test - FREEDOM Variant	4	2019	1	2020
ASW TECHEVAL: Anti-Submarine Warfare Technical Evaluation - FREEDOM Variant	1	2020	1	2020

**UNCLASSIFIED**

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP		Project (Number/Name) 3096 / Littoral Combat Ship	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
ASW IOT&E: Anti-Submarine Warfare Mission Package Initial Operational Test and Evaluation - FREEDOM Variant		3	2020	3	2020
ASW DT: Anti-Submarine Warfare Developmental Test - INDEPENDENCE Variant		4	2020	4	2020
DT MCM: Mine Countermeasures Mission Package Developmental Testing - INDEPENDENCE Variant		2	2021	3	2021
L&S IPR 1: LCS Lethality & Survivability In Progress Review		3	2021	3	2021
MCM TECHEVAL: Mine Countermeasures Mission Package Technical Evaluation - INDEPENDENCE Variant		4	2021	1	2022
MCM IOT&E: Mine Countermeasures Mission Package Initial Operational Test and Evaluation - INDEPENDENCE Variant		1	2022	2	2022
L&S IPR 2: LCS Lethality & Survivability In Progress Review		2	2022	2	2022
MCM DT: Modular Mine Countermeasure Mission Package Developmental Testing - FREEDOM Variant		3	2022	4	2022
MCM IOT&E: Modular Mine Countermeasure Mission Package Initial Operational Test and Evaluation - FREEDOM Variant		1	2023	1	2023
L&S IPR 3: LCS Lethality & Survivability In Progress Review		1	2023	1	2023
L&S Combat System Certification: LCS Lethality & Survivability Combat System Certification		4	2023	4	2023
L&S Combat System Test Period: LCS Lethality & Survivability Combat System Test Period		3	2024	4	2024

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 4506 / LCS Training			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
4506: LCS Training	30.201	19.442	15.777	1.153	-	1.153	2.748	0.893	0.915	0.933	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 374												
Note The FY 2020 funding request was reduced by \$1.000 million to account for the availability of prior year execution balances.												
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.  FY2020 funding will complete the development of the Immersive Virtual Ship Environment (IVSE) and Virtual Reality (VR) 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: LCS Total System Training Architecture  Articles:								19.442	15.777	1.153	0.000	1.153
								-	-	-	-	-
FY 2019 Plans: FY19 funding provides for the development and testing of multiple training courseware products which provide the fleet with required training capabilities. Funding provides NAWC TSD program management oversight while they complete the development of LCS deck operations (both variants), continue combat systems IVSE courseware and begin the development of the combat systems part task trainer. NAWC will start the development of the VTUAV visual display trainer, oversee performance of the development effort, while providing additional support efforts to the LCS Fleet Introduction Program Office (PMS 505). This funding also supports continued NAVFAC efforts preparing for additional small ship homeports required by the Strategic Laydown plan.												
FY 2020 Base Plans:												



**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP	Project (Number/Name) 4506 / LCS Training	

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
<p>FY20 funding provides the development of advanced Immersive Virtual Ship Environment (IVSE) courseware and associated simulators to achieve the training objectives. (Additionally, after fielding these systems and courseware, RDT&amp;E funds will be utilized to upgrade training to maintain conformity with LCS configurations and approved operational technical manuals and procedures. RDT&amp;E funds are also used to test and evaluate training devices to verify compliance with requirements.) RDT&amp;E funding provides NAWC TSD program management oversight while they complete the LCS deck operations (both variants), continue combat systems IVSE courseware and the combat systems part task trainer. (NAWC will continue the development of the VTUAV visual display trainer, oversee performance of the development effort, while providing additional support efforts to PMS 505). This funding also supports continued NAVFAC efforts preparing for additional small ship homeports required by the Strategic Laydown plan.</p> <p><b><i>FY 2020 OCO Plans:</i></b> N/A</p> <p><b><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></b> IVSE Deck courseware completes in FY2020. All planned LCS Training Courseware products have been funded so although their development continues, FY20 funding will be focused on upgrading training to maintain conformity with LCS configuration.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	19.442	15.777	1.153	0.000	1.153

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/5664: Surface Training Equipment	81.595	227.791	233.175	-	233.175	171.634	114.680	79.313	77.409	Continuing	Continuing

**Remarks**

PEO USC funding accounts for only a portion of the OPN 5664 line.

**D. Acquisition Strategy**

Per the combined LCS Navy Training System Plan (NTSP), the LCS core crew training concept will meet Train to Qualify and Train to Certify requirements incrementally, with expected completion in FY20. 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

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy		<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U) <i>LITTORAL COMBAT SHIP</i>	<b>Project (Number/Name)</b> 4506 / <i>LCS Training</i>
<p>Diego LCS Training Facility (LTF), which includes 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.</p> <p><b><u>E. Performance Metrics</u></b></p> <p>T2Q will succeed and support mission accomplishment in the long run only if commanders have confidence that the output is valid, reliable, and standardized. To justify that confidence, training outcomes must mirror, and therefore predict, critical mission outcomes. To achieve that result a set of objective, performance-based measures, metrics, and standards is being developed for each watch station and billet requirement. For qualifications to be truly predictive, they must be guaranteed by the application of objective measures that vary little between evaluators. New courses such as the Surface Warfare Officers School (SWOS) LCS Officer of the Deck (OOD), Junior Officer of the Deck (JOOD) and the LCS Shore-Based Trainer Capstone courses have been designed to meet T2Q standards. Ultimately, success of the training acquisition strategy will be objectively validated by accomplishment of PQS by the sailors as determined by the IVSE and achievement of all requirements in the LCS Training Manual (TRAMAN) as assessed by LCS Squadrons and appropriate Afloat Training Groups (ATG).</p>		

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 4506 / LCS Training					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	1.878	0.000		2.550	Nov 2018	0.150	Nov 2019	-		0.150	0.000	4.578	-
Combat Systems Courseware	C/FFP	Cubic : Orlando, FL	14.200	10.062	Nov 2017	7.316	Nov 2018	0.150	Nov 2019	-		0.150	7.800	39.528	-
Eng. Training Courseware	C/FFP	Cubic : Orlando, FL	1.092	0.000		0.000		0.000		-		0.000	0.000	1.092	-
Training Development - Support	WR	NAWC/TSD : Orlando, FL	7.750	3.375	Nov 2017	0.587	Nov 2018	0.251	Oct 2019	-		0.251	Continuing	Continuing	Continuing
VTUAV/MH60	C/FFP	TBD : TBD	0.000	0.000		1.000	Mar 2019	0.178	Nov 2019	-		0.178	6.270	7.448	-
Combat System Part Task Trainer	C/FP	TBD : TBD	0.000	0.000		1.500	Mar 2019	0.000		-		0.000	0.000	1.500	-
Mission Bay Trainer	C/CPAF	Cubic : Orlando, FL	0.822	0.000		0.000		0.000		-		0.000	0.000	0.822	-
Subtotal			25.742	13.437		12.953		0.729		-		0.729	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.524	0.180	Nov 2017	0.000		0.030	Nov 2019	-		0.030	Continuing	Continuing	Continuing
Information Assurance	WR	NSWC, DN : Dam Neck, VA	1.614	1.500	Nov 2017	1.500	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Training ISEA	WR	NSWC/PHD : Port Huenum, CA	0.741	0.500	Nov 2017	0.000		0.194	Nov 2019	-		0.194	Continuing	Continuing	Continuing
Warfare Center SME/ NAVFAC	WR	VARIOUS : VARIOUS	0.067	0.170	Nov 2017	0.150	Nov 2018	0.050	Nov 2019	-		0.050	Continuing	Continuing	Continuing
Subtotal			2.946	2.350		1.650		0.274		-		0.274	Continuing	Continuing	N/A

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2020 Navy												<b>Date:</b> March 2019		
<b>Appropriation/Budget Activity</b> 1319 / 4						<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP				<b>Project (Number/Name)</b> 4506 / LCS Training				

  

Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	1.513	3.655	Mar 2018	1.174	Mar 2019	0.150	Nov 2019	-		0.150	Continuing	Continuing	Continuing
<b>Subtotal</b>			1.513	3.655		1.174		0.150		-		0.150	Continuing	Continuing	N/A

  

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	30.201	19.442	15.777	1.153	-	1.153	Continuing	Continuing	N/A

  

**Remarks**

**UNCLASSIFIED**

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy																				Date: March 2019																	
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP										Project (Number/Name) 4506 / LCS Training																	
Proj 4506										FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
										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
Interactive Virtual Shipboard Environment																																					
DECK IVSE- Development										Contract Award ▲																											
										DECK IVSE- Development																											
Combat System Courseware Development										Combat System Courseware Development																											
VTUAV/MH60 Development																Contract Award ▲																					
										VTUAV/MH60 Development																											
Training Development																																					
Training Development										Training Development - Support																											
Combat System Part Task Trainer																																					
																Contract Award ▲																					
										Combat Systems Part Task Trainer - Development																											
2020DON - 0603581N - 4506																																					

2020DON - 0603581N - 4506

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Navy			<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP	<b>Project (Number/Name)</b> 4506 / LCS Training	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 4506</b>				
Interactive Virtual Shipboard Environment: DECK IVSE- Development: DECK IVSE Contract Award	1	2018	1	2018
Interactive Virtual Shipboard Environment: DECK IVSE- Development: DECK IVSE- Development	1	2018	2	2020
Interactive Virtual Shipboard Environment: Combat System Courseware Development: Combat System Courseware Development	1	2018	1	2021
Interactive Virtual Shipboard Environment: VTUAV/MH60 Development: VTUAV/MH60 Contract Award	2	2019	2	2019
Interactive Virtual Shipboard Environment: VTUAV/MH60 Development: VTUAV/MH60 Development	2	2019	4	2022
Training Development: Training Development: Training Development - Support	1	2018	4	2024
Combat System Part Task Trainer: Combat Systems Part Task Trainer - Contract Award	2	2019	2	2019
Combat System Part Task Trainer: Combat Systems Part Task Trainer - Development	2	2019	2	2021

# UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	9.651	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.651
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**  
Congressional Add funding will be used to develop advanced Immersive Virtual Ship Environment (IVSE)/ Virtual Reality (VR) courseware and associated simulators to achieve the training objectives. Funding will continue the Courseware development efforts of the LCS IVSE Deck Operations (both variants FREEDOM / INDEPENDENCE) and LCS IVSE Combat Systems Trouble Shooting Courseware (both variants FREEDOM / INDEPENDENCE).

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>
<b>Congressional Add:</b> LCS Training Courseware	9.651	10.000
<b>FY 2018 Accomplishments:</b> Continued the Courseware development efforts of the LCS IVSE Deck Operations (both FREEDOM / INDEPENDENCE variants) and LCS IVSE Combat Systems Trouble Shooting Courseware (both FREEDOM / INDEPENDENCE variants).		
<b>FY 2019 Plans:</b> Continued the Courseware development efforts of the LCS IVSE Deck Operations (both FREEDOM / INDEPENDENCE variants) and LCS IVSE Combat Systems Trouble Shooting Courseware (both FREEDOM / INDEPENDENCE variants).		
<b>Congressional Adds Subtotals</b>	9.651	10.000

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

**Remarks**

**D. Acquisition Strategy**  
N/A

**E. Performance Metrics**  
Immersive Virtual Ship Environment (IVSE) courseware development

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy												Date: March 2019			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / (U)LITTORAL COMBAT SHIP						Project (Number/Name) 9999 / Congressional Adds			
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	0.000	3.625	Jun 2019	3.763	Jun 2019	0.000		-		0.000	0.000	7.388	-
Combat Systems Courseware	C/FFP	Cubic : Orlando, FL	0.000	5.245	Jun 2018	5.445	Jun 2019	0.000		-		0.000	0.000	10.690	-
Training Development Support	WR	NAWC TSD : Orlando, FL	0.000	0.781	Jun 2018	0.792	Jun 2019	0.000		-		0.000	0.000	1.573	-
Subtotal			0.000	9.651		10.000		0.000		-		0.000	0.000	19.651	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	9.651		10.000		0.000		-		0.000	0.000	19.651	N/A
Remarks															



**UNCLASSIFIED**

PE 0603581N: (U)LITTORAL COMBAT SHIP  
Navy

R-1 Line #49

Project (Number/Name)	9999 / Congressional Adds

Proj 9999	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
LCS Interactive Virtual Shipboard Environment (IVSE)																												
LCS IVSE Congressional Add																												
LCS IVSE Deck Operations Development																												
LCS IVSE Combat Systems Trouble Shooting Courseware Development																												

2020PB - 0603581N - 9999

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Navy		<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603581N / (U)LITTORAL COMBAT SHIP	<b>Project (Number/Name)</b> 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 9999</b>				
LCS Interactive Virtual Shipboard Environment (IVSE): LCS IVSE Deck Operations Development: LCS IVSE Deck Operations Development	1	2018	4	2019
LCS Interactive Virtual Shipboard Environment (IVSE): LCS IVSE Combat Systems Trouble Shooting Courseware Development: LCS IVSE Combat Systems Trouble Shooting Courseware Development	1	2018	4	2019