Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
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 0603564N *I Ship Prel Design & Feasibility Studies*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	28.413	12.839	22.534	70.270	-	70.270	156.841	158.832	159.542	83.610	Continuing	Continuing
0409: *DDG-51 Flt III Concept Development*	0.000	0.000	0.000	5.545	-	5.545	4.805	4.903	6.101	3.000	Continuing	Continuing
0411: *Future Surface Combatant Concept Development*	0.000	0.000	0.000	46.453	-	46.453	129.472	145.886	143.629	70.601	Continuing	Continuing
3377: *T-ATS Ship Concept Development*	4.584	0.391	0.893	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.868
3389: *OPLOG IPT Development*	23.829	12.448	21.641	18.272	-	18.272	22.564	8.043	9.812	10.009	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 180												

Note

The FY 2021 funding request was reduced by $1.500 million to account for the availability of prior year execution balances.

Project 3389 prior years includes $11.319M FY2018 funding financed under this PE project 9999/C404 (Congressional add).

Projects 0409 and 0411 are new starts to support the DDG-51 Flight III Test and Evaluation requirements and for development of the Navy's Future Large Surface Combatant.

A. Mission Description and Budget Item Justification

0409 - This project is a new start that provides Test and Evaluation (T&E) requirements for DDG-51 Flight III to meet Initial Operational Capability (IOC) in FY24. T&E will concentrate on verifying integration and interoperability of employed technologies and systems in the DDG-51 FLT III design to achieve the mission capabilities and performance requirements as defined in the DDG-51 Flight III Capability Development Document (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). Funding planned is for the execution of Developmental Testing (DT), Operational Testing (OT), and Live Fire Test and Evaluation (LFT&E).

0411 - The Navy's Large Surface Combatant (LSC) Program is a new start for a new ship evolutionary acquisition program essential to the Future Surface Combatant Force. The purpose of the program is to initially integrate non-developmental systems into a new hull design that incorporates platform flexibility and growth capabilities to meet projected future Fleet system requirements. Initial LSCs will leverage DDG 51 Flight III combat systems as well as increased flexibility/adaptability features including expanded Space, Weight, Power & Cooling Service Life Allowances (SWaP-C SLA) to allow for more rapid and affordable upgrades in capabilities over the ships' service life and allow for fielding of future high demand electric weapons and sensor systems and computing resources. The ability of the ship's Vertical Launch System to accommodate longer and larger diameter missiles for increased speed and range of weapons, additional capacity for an embarked warfare commander

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
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 0603564N *I Ship Prel Design & Feasibility Studies*

and staff, support for 360-degree coverage with Directed Energy weapons, and improved signatures with support for additional improvements over time. The new ships will be designed to provide these initial capability increases as well as the growth capacity to support projected future systems requirements. The design will also incorporate flexibility features to quickly back-fit and forward-fit systems to pace known threats and meet future emergent needs through evolutionary block upgrades and modernization.

3389 - Naval Operational Logistics (OPLOG) Integration IPT Development - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community and Fleet customers. OPLOG develops integrated, cross-platform (i.e. applicable to more than one ship class/type) operational logistics and energy conservation technologies and capabilities as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and energy efficient logistics delivery.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	13.348	69.084	75.480	-	75.480
Current President's Budget	12.839	22.534	70.270	-	70.270
Total Adjustments	-0.509	-46.550	-5.210	-	-5.210
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-46.550			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.509	0.000			
• Program Adjustments	0.000	0.000	-5.210	-	-5.210
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Change Summary Explanation

FY21 Change Explanation -$5.210M

Proj 0409 - Increase $+5.545M for DDG-51 Flight III Test and Evaluation including (DT/OT) to support Initial Operating Capability (IOC) in FY24.

Proj 3389 - Decrease of -4.048M due to $-2.562M for cancellation of OPLOG R&D efforts without a transition plan and by $-1.500M to account for the availability of prior year execution balances.

Proj 0411 - Decrease of $-6.707M due to revised acquisition strategy

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0409 / *DDG-51 Flt III Concept Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0409: *DDG-51 Flt III Concept Development*	0.000	0.000	0.000	5.545	-	5.545	4.805	4.903	6.101	3.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 180

Note

This project is a new start.

A. Mission Description and Budget Item Justification

This project provides Test and Evaluation (T&E) requirements for DDG-51 Flight III to meet Initial Operational Capability (IOC) in FY24. T&E will concentrate on verifying integration and interoperability of employed technologies and systems in the DDG-51 FLT III design to achieve the mission capabilities and performance requirements as defined in the DDG-51 Flight III Capability Development Document (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). Funding planned is for the execution of DT, OT, and LFT&E.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: DDG-51 Flight III Test and Evaluation	0.000	0.000	5.545	0.000	5.545
Articles:	-	-	-	-	-
FY 2020 Plans: N/A					
FY 2021 Base Plans: Conduct DDG-51 test planning in support of Development Testing, Operational Testing (DT/OT), including Live Fire Test and Evaluation (LFT&E). Begin Modeling and Simulation (M&S) updates and Verification Validation, and Accreditation (VV&A) planning activities to include Total Mine Simulation System (TMSS), Cruise Missile analysis, Advance Survivability Assessment Program (ASAP), Integrated Recovery Model (IRM), and Navy Enhanced Sierra Mechanics (NESM). DDG-51 FLT III Cyber Security DT Cooperative Vulnerability Identification (CVI) evaluation will also be included in planning events.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Establishes funding in FY21 for DDG-51 Flight III T&E efforts.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.545	0.000	5.545

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• SCN/2122: *DDG-51 Class*	5,878.031	5,809.323	1,388.201	-	1,388.201	3,592.416	2,375.950	4,021.363	1,935.953	3,987.100	112,788.539

Remarks

D. Acquisition Strategy

The DDG-51 class ships use a competitive acquisition strategy using Multi-Year Procurement (MYP) contracts awarded to two shipbuilders in FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0409 / *DDG-51 Flt III Concept Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Modeling and Simulation	WR	NRL : Washington, DC	0.000	0.000		0.000		0.459	Oct 2020	-		0.459	Continuing	Continuing	Continuing
Modeling and Simulation	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.000		0.819	Oct 2020	-		0.819	Continuing	Continuing	Continuing
Modeling and Simulation	WR	NSWC : Panama City, FL	0.000	0.000		0.000		0.287	Oct 2020	-		0.287	Continuing	Continuing	Continuing
Modeling and Simulation	Various	T&E Solutions : Various	0.000	0.000		0.000		0.900	Dec 2020	-		0.900	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC : Philadephia, PA	0.000	0.000		0.000		0.050	Oct 2020	-		0.050	Continuing	Continuing	Continuing
Test and Evaluation	Various	T&E Solutions : Various	0.000	0.000		0.000		0.100	Dec 2020	-		0.100	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	0.000	0.000		0.000		0.965	Nov 2020	-		0.965	Continuing	Continuing	Continuing
LFT&E	Various	T&E Solutions : Various	0.000	0.000		0.000		0.320	Dec 2020	-		0.320	Continuing	Continuing	Continuing
Cyber DT	Various	Various : Various	0.000	0.000		0.000		1.645	Nov 2020	-		1.645	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		5.545		-		5.545	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		5.545		-		5.545	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

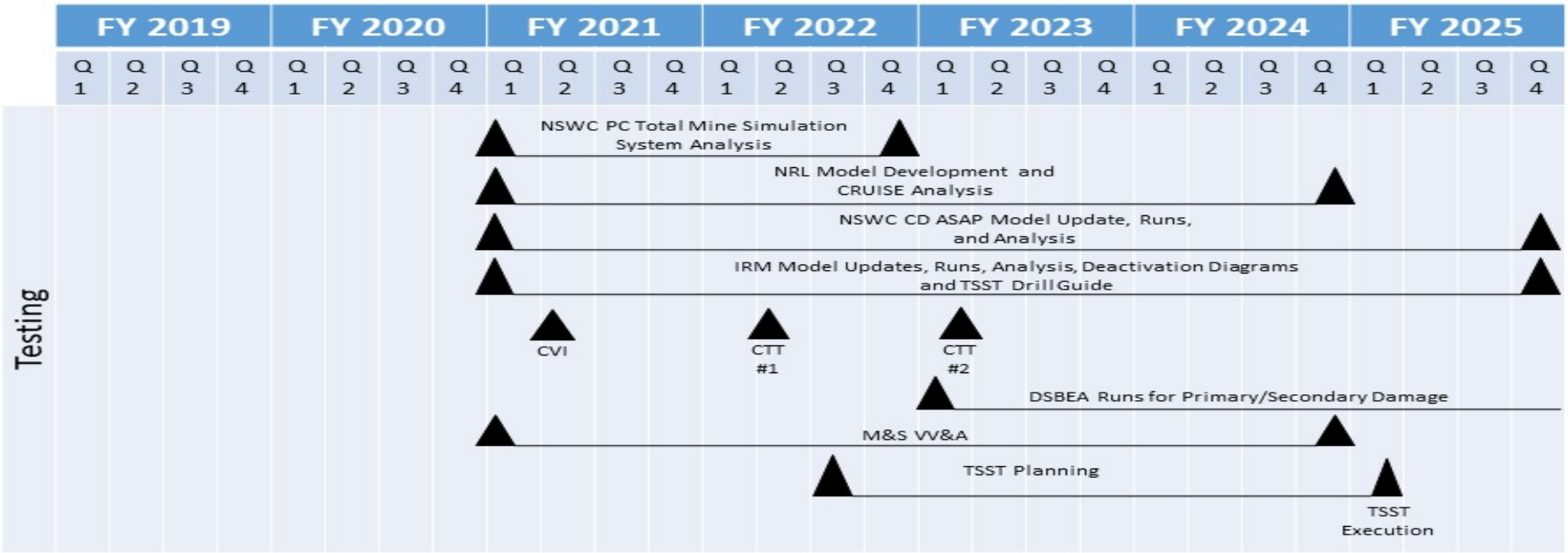

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0409 / *DDG-51 Flt III Concept Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0409				
Total Mine Simulation System (TMSS) Analysis	1	2021	4	2022
Model Development and CRUISE Missile Analysis	1	2021	4	2024
Advance Survivability Assessment Program (ASAP) Model Update, Runs, and Analysis	1	2021	4	2025
Integrated Recovery Model (IRM) Update and Analysis	1	2021	4	2025
Modeling & Simulation (M&S) Verification Validation, and Accreditation (VV&A)	1	2021	4	2024
Cooperative Vulnerability Identification (CVI)	2	2021	2	2021
Cyber Table Top (CTT) -1	2	2022	2	2022
Total Ship Survivability Test (TSST) Planning	3	2022	4	2024
Damage Scenario Based Engineering Analyses (DSBEA) Runs for Primary/Secondary Damage	1	2023	4	2025
Cyber Table Top (CTT) - 2	1	2023	1	2023
Total Ship Survivability Test (TSST) Execution	1	2025	1	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0411 / *Future Surface Combatant Concept Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
0411: *Future Surface Combatant Concept Development*	0.000	0.000	0.000	46.453	-	46.453	129.472	145.886	143.629	70.601	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start.

A. Mission Description and Budget Item Justification

The Navy's Large Surface Combatant (LSC) Program is a new ship evolutionary acquisition program essential to the Future Surface Combatant Force. The purpose of the program is to initially integrate non-developmental systems into a new hull design that incorporates platform flexibility and growth capabilities to meet projected future Fleet system requirements. Initial LSCs will leverage DDG 51 Flight III combat systems as well as increased flexibility/adaptability features including expanded Space, Weight, Power & Cooling, Service Life Allowances (SWaP-C SLA) to allow for more rapid and affordable upgrades in capabilities over the ships' service life and allow for fielding of future high demand electric weapons and sensor systems and computing resources. Additional capabilities of interest that will be evaluated for the initial ship include the ability of the ship's Vertical Launch System to accommodate longer and larger diameter missiles for increased speed and range of weapons, additional capacity for an embarked warfare commander and staff, support for 360-degree coverage with directed Energy weapons, and improved signatures with support for additional improvements over time. The new ships will be designed to provide these initial capability increases as well as the growth capacity to support projected future systems requirements. The design will also incorporate flexibility features to quickly back-fit and forward-fit systems to pace known threats and meet future emergent needs through evolutionary block upgrades and modernization.

Set Based Design will be utilized to narrow subsystem trade space, and develop a draft ship Concept of Operations (CONOPS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Large Surface Combatant Design Studies and Analysis	0.000	0.000	46.453	0.000	46.453
Articles:	-	-	-	-	-
Description: Prior year LSC efforts were conducted as part of the Future Surface Combatant Force initiative under PE 0603563N/2196 Ship Concept Advanced Design for requirements and concept feasibility studies and under PE 0603573N/2471 Integrated Power Systems for land based test related planning. In FY19 the LSC program released requests for Information (RFI) to the shipbuilding industry and the supplier industry to collect product and process information to support requirements development and concept refinement, as well as solicit input on acquisition and competition strategies that will optimally involve industry in the future design					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0411 / *Future Surface Combatant Concept Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
effort. During FY20 the program focused on requirements development and refinement, supported by cost vs. capability analyses, concept feasibility studies and early industry engagement including follow-up on the FY19 RFIs. Acquisition strategy alternatives and impacts were also assessed. Planning and preparations for shoreside testing facilities, primarily the near-term Integrated Power and Energy System Test Facility (ITF) and also the future Land-Based Engineering Site (LBES), were started. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** In FY 2021, the LSC program office will continue the efforts started in FY20, conducting additional cost vs. capability analyses, and concept feasibility studies to support development of a draft Capabilities Development Document (CDD) and draft specifications. A Set Based Design approach will continue to be utilized to narrow subsystem trade space, and develop a draft ship Concept of Operations (CONOPS). Industry engagement will be increased focused on producibility and affordability analyses. Products developed or updated this year will include Integrated Master Schedule, Engineering Management Plan, Initial Ship Baseline (including General Arrangements, Topside arrangements, power and propulsion architecture and Master Equipment List, and Subsystems identification), Requirements Allocation, Preliminary Manning Assessment, Signatures budget, and Systems Engineering Plan. Upon approval of the draft CDD for LSC in Q1FY21, and execution of a successful System Requirements Review in 2QFY21 the Preliminary Design Phase will begin. During FY21 Initial Operational Capability (IOC) of the Integrated Power and Energy System Test Facility (ITF), comprising a digital twin of the ITF, engineering development models and prototypical equipment, will occur to address risks with critical systems. In addition, ITF will support validation of digital engineering models, including, but not limited to, virtual prototyping of a Flexible Bus Node, a component that facilitates protection of the power system busses and provision of power to shipboard equipment. Necessary modifications of the ITF will continue in a phased approach to support testing for LSC. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0411 / *Future Surface Combatant Concept Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Increase from FY20 to FY21 is to transition from concept refinement and requirements development to a Preliminary Design Effort for the LSC. The increase also supports vendor and shipyard involvement in the design team as well as validation of CDD requirements.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	46.453	0.000	46.453

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• RDTEN/0603563N/2196: *Ship Concept Advanced Design*	23.101	33.595	21.520	-	21.520	11.505	10.643	9.659	9.791	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Navy envisions an evolutionary acquisition strategy for LSC utilizing a flexible, adaptable HM&E design coupled with open architecture mission systems that will allow for affordable block buys utilizing the most up to date mission systems available at the time of acquisition. The initial LSCs will utilize the DDG 51 Flight III Combat System with additional capabilities as described above. The schedule for LSC commences Preliminary Design in FY 2021. Contract Design, with primary objectives of development of an Allocated Baseline and development of a ship specification and selected procurement specifications will follow Preliminary Design with objective of issuance of an RFP for Detail Design and Construction.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0411 / *Future Surface Combatant Concept Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Design Engineering Contract	C/CPAF	Various : Various	0.000	0.000		0.000		16.150	Dec 2020	-		16.150	Continuing	Continuing	Continuing
Systems Engineering & Design Integration	WR	Not Specified : Not Specified	0.000	0.000		0.000		3.153	Oct 2020	-		3.153	0.000	3.153	-
Naval Architecture System Development	WR	NSWC Carderock : Carderock, MD	0.000	0.000		0.000		6.200	Oct 2020	-		6.200	0.000	6.200	-
Marine Engineering System Development	WR	NSWC Philadelphia : Philadelphia, PA	0.000	0.000		0.000		2.200	Oct 2020	-		2.200	0.000	2.200	-
Warfare Systems Development	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		1.850	Oct 2020	-		1.850	0.000	1.850	-
Shipboard Systems Development	WR	Other Government Organizations : Various	0.000	0.000		0.000		9.750	Oct 2020	-		9.750	0.000	9.750	-
Land Based Integration and Test	WR	Other Government Organizations : Various	0.000	0.000		0.000		5.150	Oct 2020	-		5.150	0.000	5.150	-
		Subtotal	0.000	0.000		0.000		44.453		-		44.453	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	Various : Various	0.000	0.000		0.000		1.100	Oct 2020	-		1.100	0.000	1.100	-
Design Management and Integration	Various	Various : Various	0.000	0.000		0.000		0.900	Oct 2020	-		0.900	0.000	0.900	-
		Subtotal	0.000	0.000		0.000		2.000		-		2.000	0.000	2.000	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		46.453		-		46.453	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 0411 / *Future Surface Combatant Concept Development*	

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0411 / *Future Surface Combatant Concept Development*

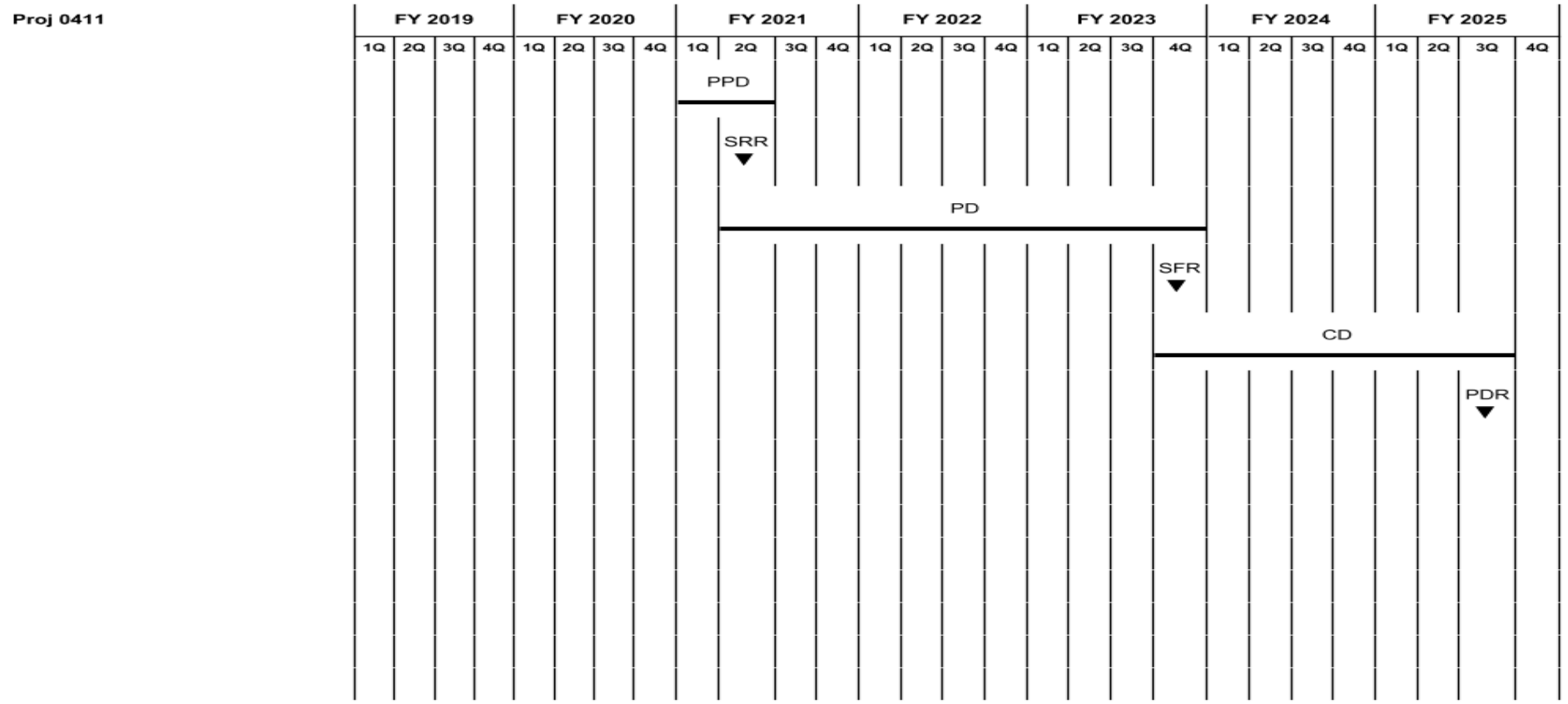

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 0411 / *Future Surface Combatant Concept Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0411				
Pre Preliminary Design	1	2021	2	2021
System Requirements Review	2	2021	2	2021
Preliminary Design	2	2021	4	2023
System Functional Review	4	2023	4	2023
Contract Design	4	2023	3	2025
Preliminary Design Review	3	2025	3	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3377 / *T-ATS Ship Concept Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3377: *T-ATS Ship Concept Development*	4.584	0.391	0.893	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.868
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Towing, Salvage and Rescue Ships (T-ATS 6 Class) will recapitalize the current Fleet tugs and salvage ships with a common hull that is capable of performing the missions of the retiring T-ATF and T-ARS classes. This project provides Test and Evaluation Phase Developmental Testing (DT) and Operational Testing (OT) requirements per the Test and Evaluation Master Plan (TEMP) schedule.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: T-ATS 6 Class Test & Evaluation (T&E)	0.391	0.893	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2020 Plans: Complete the execution of Test and Evaluation (T&E) Phase Developmental Testing (DT) and Operational Testing (OT) per the Test and Evaluation Master Plan (TEMP) schedule. Coordinate efforts with NAVSEA, Military Sealift Command (MSC), PEO Ships, Operational Test and Evaluation Force (OPTEVFOR) , Joint Interoperability Test Command (JITC) and OSD Director of Operational Test & Evaluation (ODT&E).					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: T&E efforts complete in FY 2020. No funding required FY 2021 and out.					
Accomplishments/Planned Programs Subtotals	0.391	0.893	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• SCN/5035: *Towing, Salvage, and Rescue Ship (T-ATS)*	80.517	150.282	168.209	-	168.209	80.800	0.000	0.000	0.000	0.000	630.897

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS Ship Concept Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Detail Design and Construction (DD&C) was awarded for Lead Hull in March 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3377 / *T-ATS Ship Concept Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	Various	NAVAIR/NSWC/ NIWC : MD, MD, SC	0.769	0.000		0.000		0.000		-		0.000	0.000	0.769	-
Industry Design Studies	Various	Various : Various	0.679	0.000		0.000		0.000		-		0.000	0.000	0.679	-
		Subtotal	1.448	0.000		0.000		0.000		-		0.000	0.000	1.448	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Milestone Documention Support	C/FFP	CACI : DC	2.041	0.000		0.000		0.000		-		0.000	0.000	2.041	-
RFP and Specification Development	Various	Alion/CACI/NIWC : DC, DC, SC	0.705	0.000		0.000		0.000		-		0.000	0.000	0.705	-
Test & Evaluation Execution	Various	OPTEVFOR, CACI, ALION : VA, DC	0.390	0.300	Jan 2019	0.350	Dec 2019	0.000		-		0.000	0.000	1.040	-
		Subtotal	3.136	0.300		0.350		0.000		-		0.000	0.000	3.786	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing/ Operational Testing	C/FFP	Various : Various	0.000	0.091	Jun 2019	0.543	Apr 2020	0.000		-		0.000	0.393	1.027	-
		Subtotal	0.000	0.091		0.543		0.000		-		0.000	0.393	1.027	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.584	0.391		0.893		0.000		-		0.000	0.393	6.261	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS Ship Concept Development*

T-ATS Design & Total Ship Integration

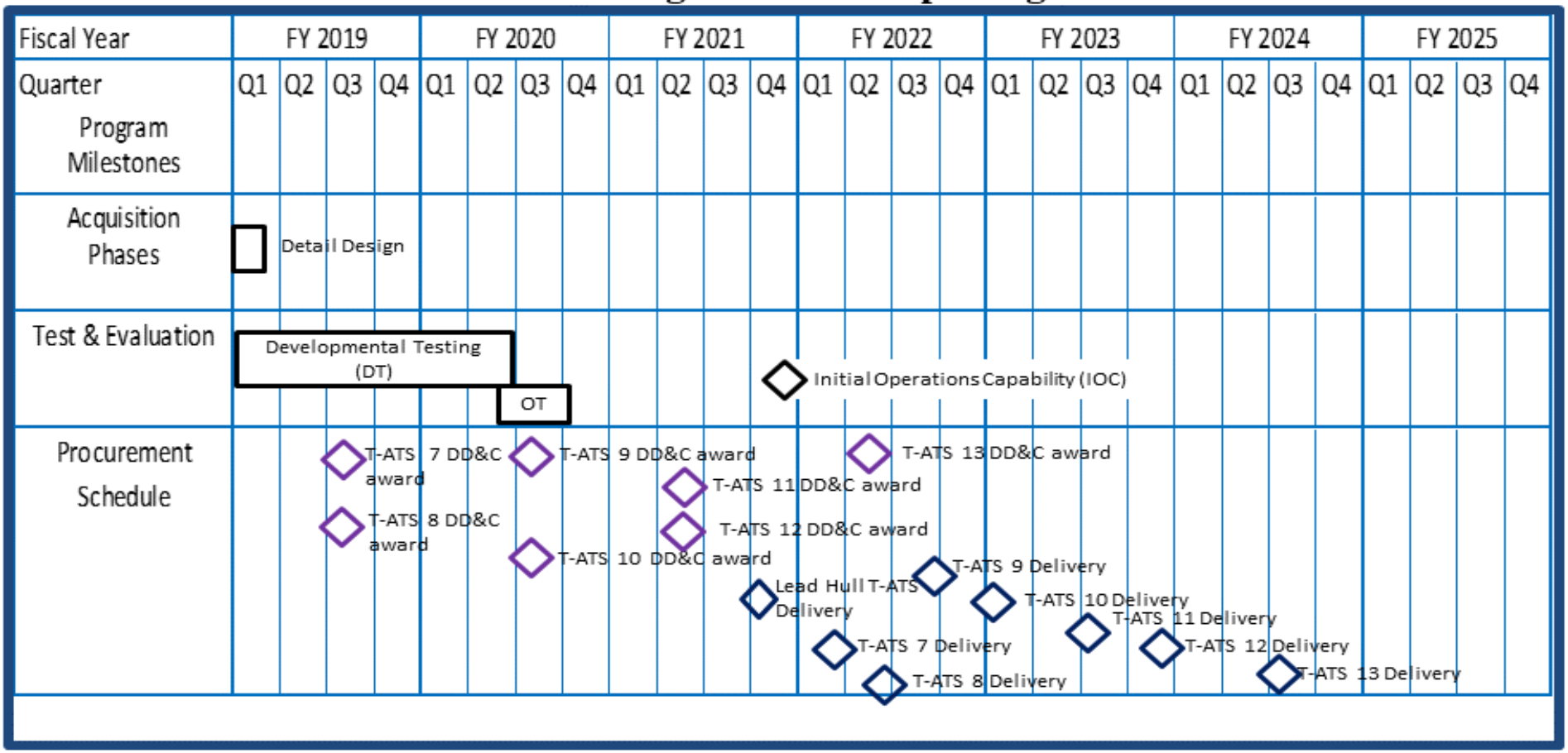

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3377 / *T-ATS Ship Concept Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3377				
Deveopmental Testing/Operational Testing	1	2019	3	2020
Initial Operational Capabilities	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / *Ship Prel Design & Feasibility Studies*	Project (Number/Name) 3389 / *OPLOG IPT Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3389: *OPLOG IPT Development*	23.829	12.448	21.641	18.272	-	18.272	22.564	8.043	9.812	10.009	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY2016 and prior year efforts were financed under NDSF BA4 PE 0408042N Project 3117 Naval Operational Logistics (OPLOG) Integration. FY2017, FY2019 and forward is financed under this Program Element (Project 3389). FY2018 financed under Congressional add Project 9999/C404 included in prior years shown in this budget.

A. Mission Description and Budget Item Justification

Project 3389 - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply systems; defines integrated combat logistics force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community, and Fleet customers. Operational Logistics Integration R&D (OPLOG) develops integrated, cross-platform (i.e. applicable to more than one ship class/type) operational logistics and operational energy conservation technologies and capabilities as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and energy efficient logistics delivery.

Though the operational logistics family of systems touches all aspects of Naval presence and power projection, operational logistics capability and system interfaces typically have been left to individual acquisition programs to develop and resolve. Technology development is necessary to mitigate technological and operational risk before ship acquisition programs accept new technologies. This project provides a foundation for the transition and systems development of science & technology initiatives evolving from the Office of Naval Research (ONR) Power & Energy Future Naval Capabilities (FNC), Enterprise and Platform Enablers FNC, Seabasing FNC, and from other enabling Government, industry and academia concepts to the acquisition community. Thus, this project resources continued research and development of appropriate technologies with applicability to multiple acquisition programs and defines and matures performance and interface requirements for those technologies. This project continues to identify, develop, integrate, demonstrate, and transition logistics technologies to improve the cost effectiveness of Fleet at sea logistics delivery through outreach, coordination and collaboration with industry, academia, Fleet, and Enterprise representatives.

This project will continue to develop improved shipboard replenishment, transfer, and handling systems and components as well as asset visibility and standardized packaging technologies. This project includes development of approaches to reduce operation and maintenance costs of, and energy consumption by the logistics Fleet. This integrated suite of developed capabilities will enable multiple ship types to leverage common technologies common across DoD (Joint) and commercial transportation networks providing a more affordable, energy efficient, mission capable force. These capabilities and system-of-systems approach will be applied to concept development of future auxiliary force
architectures.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Advanced Systems	8.948	20.391	17.738	0.000	17.738
Articles:	-	-	-	-	-
FY 2020 Plans: Continue advanced refueling system R&D to include: Continue Seabased Petroleum Distribution System (SPDS) scaled prototype development, demonstrations, and test and evaluations; complete Open Ocean Joint Off-Shore Fuel Farm (JOFF) concept development and begin prototype development, test and evaluation; continue modular Consolidated (CONSOL) tanker adapter kit test, evaluation, and demonstrations; and continue Improved Modular Fuel Distribution System (iMFDS) detailed design and prototype development; Complete Expeditionary Advanced Base Operations (EABO) JOFF concept development and begin prototype development.					
FY 2021 Base Plans: Research, development, and testing of advanced refueling systems and concepts to include: performing operationally relevant testing of SPDS system and complete detailed design and build for the FY21 scaled prototype. Begin to develop full scale SPDS prototype; Continue to develop the Open Ocean and EABO support JOFF variant development; Continue CONSOL and iMFDS development and testing.					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: A total decrease of $2.653M is result of completion of two JOFF concept developments in FY20 and delaying the SPDS scaled prototype development.					
Title: Logistics Architectures	0.050	0.050	0.050	0.000	0.050
Articles:	-	-	-	-	-
Description: This is annual funding needed by the Center for Naval Analyses (CNA) to maintain the Combat Logistics Force database so OPLOG can utilize the data to support logistics R&D and concept development.					
FY 2020 Plans: Center for Naval Analyses (CNA) collects data and maintains the Combat Logistics Force (CLF) database to support ongoing and future analyses.					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Center for Naval Analyses (CNA) collects data and maintains the Combat Logistics Force (CLF) database to support ongoing and future analyses. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** No increase/decrease of funding.					
Title: Shipboard Energy Conservation (E-STREAM)	3.100	0.800	0.374	0.000	0.374
Articles:	-	-	-	-	-
FY 2020 Plans: Continue data package development for Navy Standard Transmission Replacement (NSTR) and energy initiatives Efficient shipboard Replenishment At Sea (E-RAS). ***FY 2021 Base Plans:*** Continue design data package development for NSTR for transition. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The $426K decrease in the FY21 budget is due to the completion of T&E for RAS and FAS E-STREAM.					
Title: Shipboard Material Transport	0.350	0.400	0.110	0.000	0.110
Articles:	-	-	-	-	-
FY 2020 Plans: Continue development of Lithium Ion Battery storage technologies to enable Combat Logistics Force (CLF) ships to safely transport Li batteries. Build and install First Article on T-AOE / T-AKE. Modify T-AOE and T-AKE vessels for safe Li battery storage. Design containerized storage onboard T-AKR ships with self-contained fire and safety systems. ***FY 2021 Base Plans:*** Identify additional battery storage and maintenance requirements. ***FY 2021 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** There is a $290K decrease in the FY 2021 budget due to the completion of design in FY 2020.					
Accomplishments/Planned Programs Subtotals	12.448	21.641	18.272	0.000	18.272

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable for OPLOG R&D efforts

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	VARIOUS : Various	5.600	5.000	Jan 2019	9.265	Jan 2020	8.450	Jan 2021	-		8.450	Continuing	Continuing	Continuing
Ancillary Hardware Development	Various	VARIOUS : Various	2.200	1.500	Jan 2019	2.650	Jan 2020	2.287	Jan 2021	-		2.287	Continuing	Continuing	Continuing
Ship Integration	Various	VAROUS : Various	2.100	0.600	Jan 2019	0.850	Jan 2020	0.750	Jan 2021	-		0.750	Continuing	Continuing	Continuing
Ship Suitability	Various	VARIOUS : Various	0.950	0.500	Jan 2019	1.000	Jan 2020	0.850	Jan 2021	-		0.850	Continuing	Continuing	Continuing
System Engineering	Various	VARIOUS : Various	2.250	0.940	Jan 2019	1.750	Jan 2020	1.810	Jan 2021	-		1.810	Continuing	Continuing	Continuing
		Subtotal	13.100	8.540		15.515		14.147		-		14.147	Continuing	Continuing	N/A

Remarks

1. Primary Hardware Development, Ancillary Hardware Development and System Engineering is related to the Advanced Systems Joint Offshore Fuel Farm (JOFF) and SeaBased Petroleum Distribution System (SPDS) prototype development.
2. Award dates reflect initial award of incremental execution.
3. PY includes FY2017 Proj. 3389 and FY2018 Congressional Add Proj. C404

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Suport	Various	VARIOUS : Various	1.700	0.825	Jan 2019	1.100	Jan 2020	0.820	Jan 2021	-		0.820	Continuing	Continuing	Continuing
Software Development	Various	VARIOUS : Various	0.000	0.025	Jan 2019	0.100	Jan 2020	0.025	Jan 2021	-		0.025	Continuing	Continuing	Continuing
Integrated Logistics Support	Various	VARIOUS : Various	0.518	0.300	Jan 2019	0.300	Jan 2020	0.225	Jan 2021	-		0.225	Continuing	Continuing	Continuing
Configuration Management	Various	VARIOUS : Various	1.500	0.400	Jan 2019	1.000	Jan 2020	0.605	Jan 2021	-		0.605	Continuing	Continuing	Continuing
Technical Data	Various	VAROUS : Various	1.150	0.600	Jan 2019	0.725	Jan 2020	0.400	Jan 2021	-		0.400	Continuing	Continuing	Continuing
Studies & Analysis	Various	VARIOUS : Various	0.500	0.135	Jan 2019	0.300	Jan 2020	0.175	Jan 2021	-		0.175	Continuing	Continuing	Continuing
		Subtotal	5.368	2.285		3.525		2.250		-		2.250	Continuing	Continuing	N/A

Remarks

1. Award dates reflect initial award of incremental execution.
2. PY includes FY2017 Proj. 3389 and FY2018 Congressional Add Proj. C404

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	VARIOUS : Various	2.600	0.700	Jan 2019	1.250	Jan 2020	0.825	Jan 2021	-		0.825	Continuing	Continuing	Continuing
Operational Test & Evaluation	Various	VARIOUS : Various	1.750	0.573	Jan 2019	0.951	Jan 2020	0.650	Jan 2021	-		0.650	Continuing	Continuing	Continuing
		Subtotal	4.350	1.273		2.201		1.475		-		1.475	Continuing	Continuing	N/A

Remarks

1. DT&E and OT&E cost are related to prototype test and demonstration for Advanced Systems Joint Offshore Fuel Farm (JOFF) and SeaBased Petroleum Distribution System (SPDS).
2. Award dates reflect initial award of incremental execution.
3. PY includes FY2017 Proj. 3389 and FY2018 Congressional Add Proj. C404

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	VARIOUS : Various	0.411	0.100	Jan 2019	0.150	Jan 2020	0.150	Jan 2021	-		0.150	Continuing	Continuing	Continuing
Government Engineering Support	Various	VARIOUS : Various	0.600	0.250	Jan 2019	0.250	Jan 2020	0.250	Jan 2021	-		0.250	Continuing	Continuing	Continuing
		Subtotal	1.011	0.350		0.400		0.400		-		0.400	Continuing	Continuing	N/A

Remarks

Award dates reflect initial award of incremental execution.
2. PY includes FY2017 Proj. 3389 and FY2018 Congressional Add Proj. C404

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	23.829	12.448		21.641		18.272		-		18.272	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Note: FY16 and Prior, Project 3889 was funded in PE 0408042N / *National Defense Sealift Fund* under Project 3117 OPLOG IPT development.

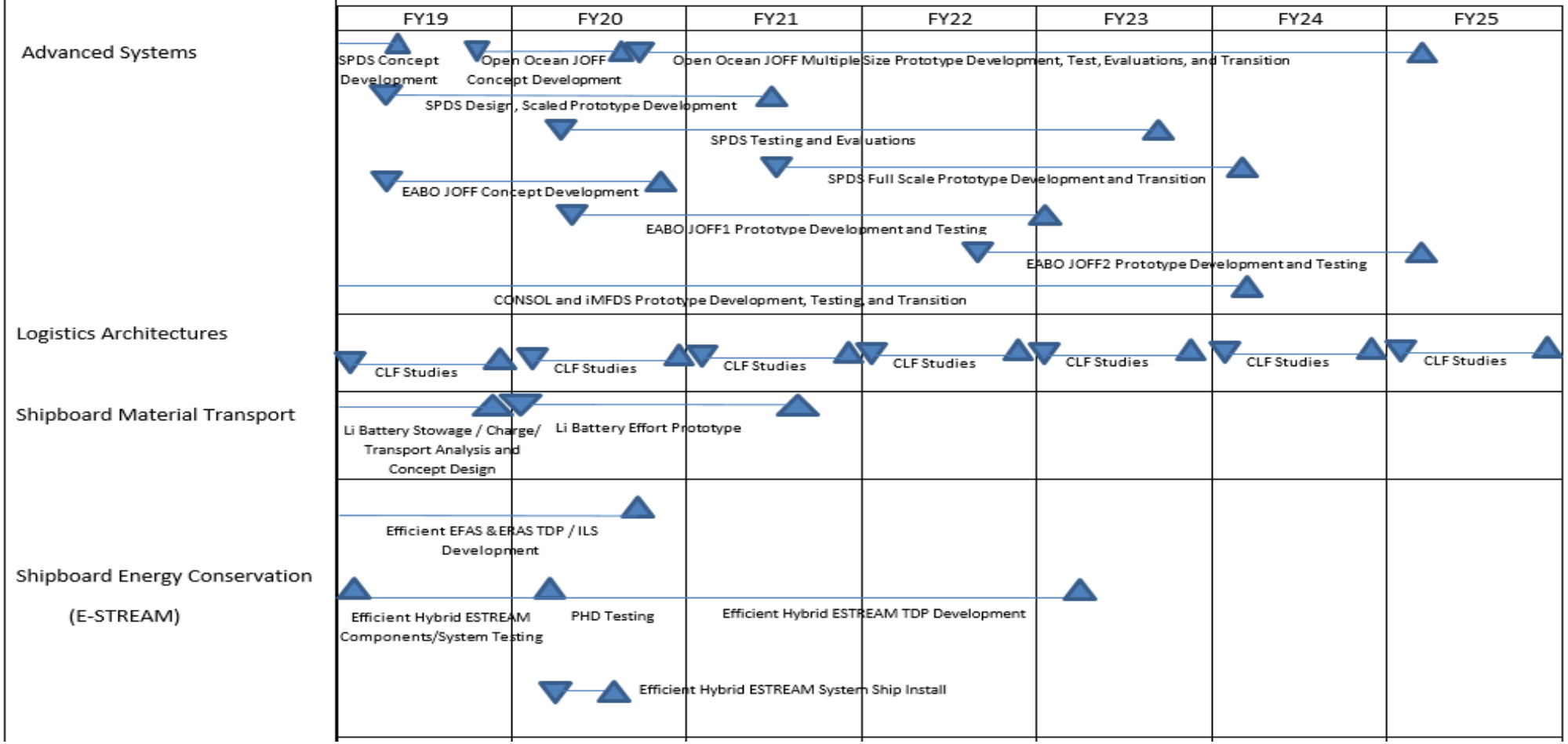

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603564N / *Ship Prel Design & Feasibility Studies*	**Project (Number/Name)** 3389 / *OPLOG IPT Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3389				
Advanced Systems	1	2019	1	2025
Logistics Architectures	1	2019	4	2025
Shipboard Energy Conservation (E-STREAM)	1	2019	1	2023
Shipboard Material Transport	1	2019	3	2021