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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
3066: <i>Large Unmanned Surface Vessel (LUSV)</i>	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing

Note

Large Unmanned Surface Vessel (LUSV) (Proj 3066) and Unmanned Surface Vehicle (USV) Enabling Capabilities (Proj 3067) were new starts in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. LUSV and USV Enabling Capabilities realigned from PE 0603502N to PE 0603178N in FY 2021.

In FY 2022, the Navy realigned funding for USV Enabling Capabilities (Proj 3067) from PE 0603178N to new PE 0605513N. Concurrent with the shift to separate Program Elements, the Navy has rebalanced the FY 2022 RDTEN profile, shifting C4I non-recurring engineering and autonomy development funding that can be applied to both the LUSV and MUSV programs into the USV Enabling Capabilities PE 0605513N. For FY2023, the Navy realigned funding for development of the Unmanned Surface Vessel Integrated Combat System Development (USV ICS) to PE 0605513N, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms. Hardware and platform-specific USV ICS requirements for LUSV and Overlord prototypes remain in LUSV PE 0603178N.

A. Mission Description and Budget Item Justification

This Program Element provides resources for the Large Unmanned Surface Vessel (LUSV), one of the two unmanned platforms in the Navy's Future Surface Combatant Force (FSCF). This Program Element also provides resources for the Overlord research and development prototype vessels. LUSVs will provide affordable, high endurance ships able to accommodate various payloads for unmanned missions and augment the Navy's manned surface force. LUSVs will be capable of semi-autonomous operation, with operators in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via an afloat element (i.e., embarked on a United States Navy (USN) combatant/other assigned afloat asset) or via an ashore element (C2 station ashore). While MUSV (PE 0605512N) and LUSV will logically share common Government Furnished Equipment (GFE) C2 systems to support fleet integration and operations and may share other autonomy and mechanical technologies (depending on acquisition approaches), they will be primarily differentiated by size and cost driven by payload capabilities, and capacities.

LUSV is a key enabler of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy and team with individual manned combatants or augment battle groups. LUSV will complement the Navy's manned combatant force by delivering increased readiness, capability and needed capacity at lower procurement and sustainment costs and reduced risk to sailors. While unmanned surface vehicles are new additions to the fleet units, LUSV will combine robust and proven commercial vessel specifications with existing military payloads to rapidly and affordably expand the capacity and capability of the surface fleet.

The Large Unmanned Surface Vessel (LUSV) development is supported by research and development prototype vessels (Overlord prototype vessels already purchased) intended to demonstrate successful integration of government furnished Command, Control, Communications, Computers and Intelligence (C4I), combat systems, and the reliability of automated hull, mechanical, and electrical (HM&E) systems. The program leverages years of investment and full scale demonstration efforts in autonomy, endurance, command and control, payloads and testing from the Defense Advanced research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV), Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter (FY 2017 to

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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603178N I (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)
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FY 2021), and Office of the Secretary of Defense Strategic Capabilities Office (OSD- SCO) Ghost Fleet Overlord Large USV experimentation effort (FY 2018 - FY 2021). The combination of fleet-ready C2 solutions developed by the Ghost Fleet Overlord program and man-in-the-loop or man-on-the-loop control will reduce the risk of fleet integration of unmanned surface vehicles and allow autonomy and payload technologies to develop in parallel with fielding vehicles with standardized interfaces.

LUSV is the baseline vessel defined in the Offensive Surface Fires Analysis of Alternatives (OSF AoA). The OSF AoA examined a wide range of material solutions to determine the most appropriate vessel to deliver additional capacity to the fleet.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	102.493	146.840	125.501	-	125.501
Current President's Budget	98.871	136.580	117.400	-	117.400
Total Adjustments	-3.622	-10.260	-8.101	-	-8.101
• Congressional General Reductions	-	-0.260			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.622	0.000			
• Rate/Misc Adjustments	0.000	0.000	-8.101	-	-8.101

Change Summary Explanation

Program Changes:

Technical: Not applicable

Schedule: Not applicable

Cost:

FY 2022: -\$3.622M SBIR/STTR/FTT Assessment (SBIR)

FY 2023: -\$10.260M Congressional -\$10.000M and -\$0.260 Miscellaneous adjustment

FY 2024: -\$8.101M Miscellaneous adjustment

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Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3066: Large Unmanned Surface Vessel (LUSV)	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Large Unmanned Surface Vessel (LUSV) (Project 3066) was a new start in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. Project 3066 realigned from PE 0603502N starting in FY 2021. The Navy has rebalanced the FY 2022 RD TEN profile, shifting C4I non-recurring engineering and autonomy development funding that can be applied to both the LUSV and MUSV programs into the USV Enabling Capabilities Project 3067 (Program Element 0605513N). For FY23, the Navy realigned funding for development of the Unmanned Surface Vessel Integrated Combat System Development (USV ICS) to PE 0605513N, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms. Hardware and platform-specific USV ICS requirements for LUSV and Overlord prototype vessels remain in LUSV PE 0603178N.

A. Mission Description and Budget Item Justification

The major goal for FY 2024 is maintaining the planned Detail Design and Construction (DD&C) for the initial production LUSV in FY 2025. The Navy instituted a comprehensive system engineering framework and supporting land and sea based prototyping plan, which will be completed prior to commencing the formal program of record and LUSV production. In support of this, the Navy has developed a holistic USV work breakdown structure (WBS) framework to help coordinate developmental and systems engineering efforts applicable across the USV portfolio and efforts that are platform-specific. The WBS categories are divided into broad key enablers, including HM&E (1.0), C4I (2.0), USV ICS (3.0), Common Control System (CCS) (4.0), autonomy (5.0), and prototyping efforts (6.0).

The supporting land and sea based prototyping plan will use the four Overlord Prototype vessels (vessels procured in FY20 will be delivered in FY22 and FY23) and various land based testing facilities to mature enabling technologies and qualify representative machinery. In support of the updated developmental and prototyping plan, the Navy is aligning Detail Design and Construction for the initial production LUSVs with the risk reduction and qualification plans described in the program System Engineering Framework (Work Breakdown Structure (WBS)). In addition, the outcome of the Offensive Surface Fires Analysis of Alternatives (OSF AoA) is supporting the refinement of program requirements leading to the validation of a Capability Development Document, acquisition strategy, and timing for procurement. The Navy's new plan does not include procurement of any additional prototype vessels.

The LUSV will be capable of weeks-long deployments and trans-oceanic transits and operate aggregated with Carrier Strike Groups (CSGs), Amphibious Ready Groups (ARGs), Surface Action Groups (SAGs), and individual manned combatants. The LUSV will be capable of autonomous navigation, transit planning, and COLREGS-compliant maneuvering and will be designed with automated propulsion, electrical generation, and support systems. LUSV missions will be conducted with operators in-the-loop (with continuous or near-continuous observation or control) or on-the-loop (autonomous operation that prompts operator action/intervention from sensory input or autonomous behaviors). LUSVs with integrated payload capability and prototypes employing non-organic payloads will not be capable of autonomous payload engagement or execution of a complete detect-to-engage sequence. The vessel will be incapable of payload activation, deactivation, or engagement without the deliberate action of a remote, off-hull human operator in the command and control loop. The program will integrate current Navy combat systems programs of record

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that have been adapted to enable remote monitoring and operational control from an off-hull command and control point, and will not be equipped with components that would enable payload engagement from onboard the vessel. USV Command and Control (C2) will be maintained via an afloat element (i.e., embarked on a United States Navy (USN) combatant), or via the ashore element (C2 station ashore).

The LUSV program is continuing to execute a comprehensive land and sea-based prototyping strategy to develop and deliver incremental capability increases, demonstrate key autonomy and automation enablers, and improve reliability of representative machinery. The Overlord research and development prototype vessels support this strategy by demonstrating successful integration of government furnished Command, Control, Communications, Computers and Intelligence (C4I) (WBS 2.0), combat systems (WBS 3.0), and the reliability of automated hull, mechanical, and electrical (HM&E) systems (WBS 1.0), eventually leading to a LUSV with the Unmanned Surface Vessel Integrated Combat System (USV ICS) and organic payloads. Early prototype vessels are enabling the Navy to accrue operational hours to gather data on autonomy, automation, and systems reliability, increase confidence in the man-machine team, and develop and refine unmanned concepts of operation (CONOPs) and tactics, techniques, and procedures (TTPs). The overarching LUSV development strategy views the purchase, fielding, and testing of the prototype USVs through the procurement of production USVs as a single developmental effort.

The LUSV Performance Specification that will be released under the Detail Design and Construction (DD&C) solicitation will heavily leverage the results of the prototype USV developmental effort, land based testing plan, LUSV industry design studies, and continued engagement with industry. The government-furnished C4I suite, and the USV ICS hardware and software that will be incorporated into the LUSV will be developed under the Unmanned Surface Vehicle Enabling Capabilities (PE 0605513N) (WBS 2.0 and 3.0). Non-organic payloads (e.g. CTEM) are being developed separately under other prototyping efforts and will be further developed and/or integrated into LUSV under the Enabling Capabilities project. Key combat systems, payload technologies, and enablers will continue to be developed and matured, leading to at-sea demonstrations, including a remotely commanded demonstration in FY 2024.

The Navy is also executing a comprehensive reliability plan with the intent to discover and implement reliability enhancements into USV machinery plants (WBS 1.0) as well as provide a means to qualify LUSV-representative machinery plants prior to award of the initial production LUSVs. The effort leveraged industry engagement initially started under the LUSV Studies Contract effort, assisting the Navy to determine reliability enhancements, improvements, and other potential machinery plant architectures designed to achieve LUSV operational and reliability requirements. Additionally, the Navy is executing a parallel effort to qualify the main engines for the prototype MUSV (same as on 3 of 4 Overlord prototype USVs), which concludes in FY 2023.

The Navy is continuing to test ancillary equipment and develop solutions for government-furnished engineering operations autonomy modules and machinery control systems at the Land Based Test Site at Naval Surface Warfare Center, Philadelphia.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development	83.271	118.561	99.050	0.000	99.050
Articles:	-	-	-	-	-
FY 2023 Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Continue machinery plant (main machinery and electrical distribution) qualification and reliability improvement plans, building on the efforts started under the LUSV Studies Contract. Continue site preparation and initial buildout of a LUSV shaft line, electrical distribution system, and expanded software and machinery control system lab at the Land Based Test Site as Naval Surface Warfare Center, Philadelphia (WBS 1.0). Reliability efforts in FY 2023 will be incorporated into the Performance Specification and captured in the DD&C RFP solicitation and associated artifacts (WBS 1.0). Purchase prototype USV ICS hardware for testing and demonstration from prototype USVs (WBS 3.0). Purchase USV ICS Command and Control (C2) Payloads for prototyping use on both manned and unmanned fleet assets (WBS6.0). Execute test and experimentation plans, led and executed by Commander, Surface Development Squadron ONE, for the prototype USVs in the inventory to continue to develop concepts of operation and unmanned/autonomous tactics, techniques, and procedures (WBS 6.0). Provide for the sustainment and maintenance of the prototype USVs in the inventory. Refine program requirements from the output of the OSF AoA leading to validation of a Capability Development Document.</p> <p>FY 2024 Base Plans: Continue machinery plant (main machinery and electrical distribution) qualification and reliability improvement plans, building on the efforts started under the LUSV Studies Contract. Continue site preparation and initial buildout of a LUSV electrical distribution system, and expanded software and machinery control system lab at the Land Based Test Site as Naval Surface Warfare Center, Philadelphia (WBS 1.0). Results from design maturation and trade studies will be incorporated into the Performance Specification and captured in the DD&C RFP Solicitation and associated artifacts (WBS 1.0). Complete Gate 4 SDS approval and Gate 4 RFP approval while preparing for Milestone B.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding is supported by the completion of Overlord USV construction as well as USV ICS hardware procurement completing for the Overlord USVs.</p>					
<p>Title: Support</p> <p align="right">Articles:</p>	13.427	15.809	16.100	0.000	16.100
<p>FY 2023 Plans: Continue support to technology development and maturation efforts (across all WBS categories) and the continued refinement of requirements and acquisition documentation including a Capability Development Document, SEP, TEMP, LCSP, Cybersecurity Strategy, Open Systems Architecture Management Plan, Quality</p>	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan, NTSP and PPP, and all other artifacts leading up to a planned Milestone review prior to the planned DD&C award for the first production LUSV. Support all land and sea based prototyping and testing (WBS 6.0), program reliability improvement efforts, collaborating with industry and government partners to gather existing reliability data on LUSV-representative machinery plants, and develop and execute plans for qualification testing (WBS 1.0). Support demonstration of the Integrated Combat System from a surface combatant in FY 2023 (WBS 1.0 and 6.0)</p> <p>FY 2024 Base Plans: Continue support to technology development and maturation efforts (across all WBS categories) and the continued refinement of requirements and acquisition documentation including a SEP, TEMP, LCSP, Cybersecurity Strategy, Open Systems Architecture Management Plan, Quality Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan, NTSP and PPP, and all other artifacts leading up to a planned Milestone review prior to the planned DD&C award for the first production LUSV. Support all land and sea based prototyping and testing (WBS 6.0), program reliability improvement efforts, collaborating with industry and government partners to gather existing reliability data on LUSV-representative machinery plants, and develop and execute plans for qualification testing (WBS 1.0). Support demonstration of the Integrated Combat System from a surface combatant in FY2024 (WBS 1.0 and 6.0).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: No significant increase.</p>					
<p>Title: Management Services</p> <p align="right">Articles:</p> <p>FY 2023 Plans: Continue efforts carrying over from FY 2022, developing governing LUSV program acquisition and requirements documentation and supporting program developmental plans. Provide management support and oversight for the 4 Overload prototype USVs.</p> <p>FY 2024 Base Plans:</p>	2.173 -	2.210 -	2.250 -	0.000 -	2.250 -

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue efforts carrying over from FY 2023, developing governing LUSV program acquisition and requirements documentation and supporting program developmental plans. Provide management support and oversight for the 4 Overlord prototype USVs. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> No significant increase.					
Accomplishments/Planned Programs Subtotals	98.871	136.580	117.400	0.000	117.400

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTEN/0605512N/3428: <i>Medium Unmanned Surface Vehicle (MUSV)</i>	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing
• RDTEN/0605513N/3067: <i>Unmanned Surface Vehicle Enabling Capabilities</i>	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing
• SCN/5119: <i>Large Unmanned Surface Vessel</i>	0.000	0.000	0.000	-	0.000	315.000	522.532	722.710	737.164	Continuing	Continuing

Remarks

D. Acquisition Strategy

In FY 2020, the Navy purchased two Overlord prototype USVs as a means to mitigate technical risk and continue to generate lessons learned through testing and experimentation, as well as to further refine CONOPs and TTPs to include manned/unmanned teaming. In FY 2020, the Navy also awarded multiple LUSV Studies Contracts for a LUSV with reservations in the design to integrate future payloads, which will inform the final Performance Specification. Additionally, in FY 2020, the Navy implemented a comprehensive reliability improvement program, which will allow continuous engagement with industry to improve reliability of representative machinery plants (main engines, generators, and ancillary equipment) as well as provide a path to qualify the MUSV (and prototype USV) main engine and representative LUSV engines and generators. This effort will continue throughout the FYDP with the goal to qualify machinery plants for incorporation into the LUSV design as well as provide a set of standards for offerors to use to prove reliability. In parallel, the Navy has established a Land Based Test Site at Naval Surface Warfare Center, Philadelphia, which will serve to test ancillary equipment as well as develop and prove government furnished engineering autonomy software and machinery

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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control systems. In PB24, the Navy delayed procurement of initial production LUSVs to FY 2025 to align with risk reduction and qualification plans as described in the program System Engineering Framework (Work Breakdown Structure (WBS)).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				3066 / Large Unmanned Surface Vessel (LUSV)							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
Prototype USV Experimentation, CONOPS Development, Reliability Demonstration, Capstone, Underway Payload & Capability Demonstrations	Various	Various : Various	30.484	41.571	Nov 2021	40.422	Nov 2022	37.280	Nov 2023	-		37.280	Continuing	Continuing	Continuing
Prototype USV Operations and Support, Crew, Fuel	Various	Various : Various	0.000	15.000	Nov 2021	22.520	Nov 2022	24.500	Nov 2023	-		24.500	Continuing	Continuing	Continuing
Prototype USV Integrated Combat System HW	TBD	TBD : TBD	0.000	0.000		21.740	Dec 2022	12.400	Nov 2023	-		12.400	0.000	34.140	-
LUSV Comprehensive Reliability Plan/Machinery Plant Qualification	Various	Various : Various	0.000	18.200	Nov 2021	17.545	Nov 2022	8.441	Nov 2023	-		8.441	Continuing	Continuing	Continuing
LUSV Studies Contracts Engineering and Reliability Studies	C/FFP	Various : Various	10.000	0.000		0.000		0.000		-		0.000	10.000	20.000	-
Prototype USV 3 & 4 post-delivery GFE Integration	Various	Various : Various	0.000	8.500	Nov 2021	11.300	Nov 2022	8.542	Nov 2023	-		8.542	Continuing	Continuing	Continuing
LUSV Requirements Development	Various	TBD : TBD	0.000	0.000		5.034	Nov 2022	7.887	Nov 2023	-		7.887	0.000	12.921	-
Subtotal			40.484	83.271		118.561		99.050		-		99.050	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 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
SUPSHIP, WF Center Support	WR	Various : Various	24.898	13.427	Nov 2021	15.809	Nov 2022	16.100	Nov 2023	-		16.100	Continuing	Continuing	Continuing
Subtotal			24.898	13.427		15.809		16.100		-		16.100	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028						
	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			
Proj 3066																															
Prototype USV	Overlord Prototype Construction [Cont'd from FY20]								Prototype Experimentation																						
LUSV Studies Contract	P-Spec Refinement & Reliability																														
Industry Engagement Industry-led (Machinery OEM) LUSV Machinery Plant Test and Qualification																															
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES) NSWC PD Site Development and WBS 1.0 Enabler Testing																															
Initial Conversion from LUSV LBTS to LBES at NSWC PD																															
Requirements Development Capability Development Document (CDD)	Development				Validation																										
Detail Design & Construction (DD&C)									RFP ▲					MS B ▲					Award ▲												
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2024PB - 0603178N - 3066

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)
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Proj 3066 (continued)	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	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
LUSV Platform Enabler Development																												
WBS 1.0 High Reliability HM&E	High Reliability HM&E																											
	Qualification																											
WBS 2.0 Overmatch Capable C4I	Overmatch Capable C4I																											
	Inc 1																											
WBS 3.0 Unmanned Surface Vessel Integrated Combat System	USV ICS																											
WBS 4.0 Common Control System	Common Control System																											
	NBVC UOC																											
	DDG UOC																											
WBS 5.0 Perception and Autonomy	Perception and Autonomy																											
WBS 6.0 Platform Prototyping	Platform Prototyping																											
	Unescorted Ops Capable																											

2024PB - 0603178N - 3066

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3066				
Prototype USV: Overlord Prototype Construction (options on WHS contract) [Continued from FY20]	1	2022	4	2023
Prototype USV: Prototype Experimentation	1	2022	4	2028
LUSV Studies Contract: Performance Specification Refinement and Reliability Studies	1	2022	3	2022
Industry Engagement: Industry-led (Machinery OEM) LUSV Machinery Plant Test and Qualification:	1	2022	4	2024
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES): NSWC PD Site Development and WBS 1.0 Enabler Testing: NSWC PD Site Development and WBS 1.0 Enabler Testing	2	2022	3	2027
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES): Initial Conversion from LUSV LBTS to LBES at NSWC PD: Initial Conversion from LUSV LBTS to LBES at NSWC PD	2	2027	4	2028
Requirements Development: Capability Development Document (CDD): CDD Development	2	2022	2	2023
Requirements Development: Capability Development Document (CDD): CDD Validation	2	2023	1	2024
Detail Design & Construction (DD&C): Milestone B	3	2025	3	2025
Detail Design & Construction (DD&C): RFP	2	2024	2	2024
Detail Design & Construction (DD&C): Source Selection	3	2024	3	2025
Detail Design & Construction (DD&C): Award	4	2025	4	2025
Proj 3066 (continued)				
LUSV Platform Enabler Development: WBS 1.0 High Reliability HM&E: WBS 1.0 High Reliability HM&E	2	2022	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LUSV Platform Enabler Development: WBS 1.0 High Reliability HM&E: WBS 1.0 High Reliability HM&E: Qualification	2	2024	2	2025
LUSV Platform Enabler Development: WBS 2.0 Overmatch Capable C4I: WBS 2.0 Overmatch Capable C4I	1	2022	4	2027
LUSV Platform Enabler Development: WBS 2.0 Overmatch Capable C4I: WBS 2.0 Overmatch Capable C4I: Increment 1	4	2024	4	2024
LUSV Platform Enabler Development: WBS 3.0 Unmanned Surface Vessel Integrated Combat System: WBS 3.0 Unmanned Surface Vessel Integrated Combat System (USV ICS)	1	2022	4	2027
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System	1	2022	4	2027
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System: NBVC UOC	4	2022	4	2022
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System: DDG UOC	1	2024	1	2025
LUSV Platform Enabler Development: WBS 5.0 Perception and Autonomy: WBS 5.0 Perception and Autonomy	1	2022	4	2028
LUSV Platform Enabler Development: WBS 6.0 Platform Prototyping: WBS 6.0 Platform Prototyping	1	2022	4	2028
LUSV Platform Enabler Development: WBS 6.0 Platform Prototyping: WBS 6.0 Platform Prototyping: Unescorted Ops Capable	3	2024	3	2024