

UNCLASSIFIED

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

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 0605513N / <i>UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES</i>
---	---

COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	119.560	181.620	-	181.620	192.885	299.182	195.298	195.827	Continuing	Continuing
3067: <i>Unmanned Surface Vehicle Enabling Capabilities</i>	0.000	0.000	119.560	181.620	-	181.620	192.885	299.182	195.298	195.827	Continuing	Continuing

Note

Unmanned Surface Vehicle (USV) Enabling Capabilities (Project 3067) was a new start in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. Project 3067 realigned from PE 0603502N to PE 0603178N in FY 2021, and from 0603178N to 0605513N in FY 2022 and future years.

A. Mission Description and Budget Item Justification

Project 3067 provides resources to develop enabling capabilities and critical technologies for the unmanned platforms in the Navy's Future Surface Combatant Force (FSCF) and Unmanned Surface Vehicle (USV) Family of Systems (FoS). This includes the development and transition of technologies, standardizing Autonomy architectures, Command & Control (C2) systems, USV Integrated Combat Systems (USV ICS) and learning through demonstration during both ashore and underway fleet exercises to support key capabilities (autonomy, communications, USV Operations Centers, sensors/component integration, data management, machinery qualification and payload prototyping) for operating Unmanned Surface Vehicles to meet mission needs. These efforts continue to maintain federated systems while encouraging the transition of Small Business Innovation Research (SBIR), Future Naval Capabilities (FNC), other DOD Science and Technology (S&T) efforts, and current Program of Record (PoR) systems to support a modular system for enhanced performance and affordability.

The USV Enabling Capabilities program is responsible for the development and improvement of USV autonomous systems, payloads, and sensors in support of machinery and Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) and USV Integrated Combat Systems (USV ICS) operations on USVs. Enabling Capabilities leads the development, modification, engineering, and integration activities, facilitating the unmanned operations of surface vessels. This includes capabilities to support autonomy, C2 beyond line of sight, monitoring, and securing sensitive equipment from remote locations. These capabilities support Medium Unmanned Surface Vehicles (MUSV), Large Unmanned Surface Vessels (LUSV), and Unmanned Operations Centers.

Project 3067 also provides a Navy-wide program to develop required standards for Autonomy, C2, Payload Interface, and USV Operations Centers in support of future unmanned surface vehicle development.

UNCLASSIFIED

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

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 0605513N / <i>UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	170.838	0.000	-	0.000
Current President's Budget	0.000	119.560	181.620	-	181.620
Total Adjustments	0.000	-51.278	181.620	-	181.620
• Congressional General Reductions	-	-0.578			
• Congressional Directed Reductions	-	-50.700			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Adjustments to Budget Year	-	-	181.620	-	181.620

Change Summary Explanation

Program Changes:

Technical: N/A

Schedule: N/A

Cost:

FY 2021: N/A

FY 2022: -\$50.7M Direct Congressional Reduction, -\$0.578K general congressional Reduction

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

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy										Date: April 2022		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES				Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
3067: <i>Unmanned Surface Vehicle Enabling Capabilities</i>	0.000	0.000	119.560	181.620	-	181.620	192.885	299.182	195.298	195.827	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Unmanned Surface Vehicle (USV) Enabling Capabilities (Project 3067) FY 2020 funding in Program Element (PE) 0603502N. Project 3067 realigned from PE 0603502N to PE 0603178N in FY 2021, and from PE 0603178N to PE 0605513N in FY 2022 and future years.

A. Mission Description and Budget Item Justification

In order to accelerate future capability and support steady growth of the Navy's Unmanned Surface Vehicle (USV) Family of Systems (FoS), the USV Enabling Capabilities project includes the development, test, and integration of USV technologies, the advancement of Defense Advanced Research Projects Agency (DARPA), Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO), Office of Naval Research (ONR) and Industry USV efforts for associated technologies, and the development and fabrication of payloads for Large Unmanned Surface Vessels (LUSVs) and Medium Unmanned Surface Vehicles (MUSVs). USV technology efforts in this project unit support the development and demonstration of autonomy, communications, USV Operations Centers, sensor and component integration for navigation compliance and reliability, data management, machinery qualification, non-combat payload feasibility, and enabling technologies for other USVs in the USV FoS, as applicable. In support of this development work, 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. 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/perception/data (5.0), and prototyping efforts (6.0).

The HM&E (WBS 1.0) portion of this project will support laboratory modeling and testing of contractor furnished Machinery Control Solutions as well as vendor qualification of engines.

The C4I (WBS 2.0) portion of this project funds efforts to develop, test, and demonstrate autonomous communication hardware and software. A key enabler to allow man-in-the-loop or man-on-the-loop control of the USVs and USV FoS will be the development of an unmanned communications suite. Initial efforts have focused on the modification of existing Program of Record of Program Executive Office (PEO) C4I systems. Further efforts are needed to engineer autonomous behaviors into the Navy's next generation of PEO C4I systems to meet USV operational needs. Additionally, this effort will include the modification and testing of cryptographic equipment as needed to obtain the necessary approvals and certifications for use in unmanned, high-threat environments.

The USV ICS (WBS 3.0) portion of this project will fund efforts to develop common combat components across all USVs and integrate the data collected and transferred from a USV into the Aegis Combat Systems in support of distributed maritime operations.

The CCS (WBS 4.0) portion of this project will fully support the continued development of USV control software.

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

The autonomy/perception/data (WBS 5.0) portion of this project funds efforts to standardize autonomy architecture and interfaces, develop and test low Technology Readiness Level (TRL) autonomy functions, develop and test common vessel control systems, software modeling and simulation, and employ a Secure Development and Operations (DevSecOps) software pipeline to facilitate integration and improve security. These autonomy efforts are executed under the Rapid Autonomy Integration Laboratory (RAIL) framework and include advanced development, prototyping, and demonstrations. The sensor and component integration for navigation compliance and reliability portion of this project funds efforts to analyze the performance of commercial hardware/software and integrate those sensors/components into USVs for improved performance. These funds also identify gaps in performance for future SBIRs, Department of Defense Science and Technology efforts, and industry feedback as well as establish standards of performance for future contracting actions. The data management portion of this project will develop the data infrastructure needed to collect, store, and analyze data from the USVs in order to certify system performance, maintain and improve software, and identify sensors/components in need of further improvement.

The prototyping efforts (WBS 6.0) portion of this project funds outfitting of the USV Operations Center. These Operations Centers will allow the Fleet to control multiple USVs and multiple types of USVs simultaneously, conduct exercises, and continue CONOPS development. This portion of the project also funds the development and acquisition of non-combat modular payloads employed by USVs. Payloads will be customized to meet Navy needs and demonstrate useful capability for the Fleet. Some examples include Intelligence, Surveillance, and Reconnaissance (ISR) payloads as well as persistent airborne systems that extend the C2 reach of host platforms.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Product Development	0.000	83.923	158.060	0.000	158.060
Articles:	-	-	-	-	-
FY 2022 Plans:					
HM&E (WBS 1.0) - Continue modeling and simulation testing of contractor furnished Machinery Control Solutions. Begin contractor engine qualifications. C4I (WBS 2.0) - Unmanned communications is a cross-platform capability, therefore development efforts are being consolidated into this project. Autonomous and remote operation requirements for next generation PEO C4I systems will be integrated into developmental programs and functional block diagrams will be developed. Further, cryptographic system development will continue including building and testing a functional prototype of a cryptographic zeroization system. Autonomy is also a cross-platform capability. ICS (WBS 3.0) - All developmental ICS efforts have been transitioned to the LUSV project unit (PE 0603178N, PU 3066) in this FY. CCS (WBS 4.0) - Continued development efforts incorporating lessons learned from experimentation and demonstrations. Autonomy/perception/data (WBS 5.0) - Refactoring of autonomy software will begin with emphasis on systems engineering, interoperability, and security requirements. These efforts will support test and evaluation. Sensor development and data management infrastructure will continue to be developed. Prototyping (WBS 6.0) - Utilize Rapid Innovative Fund (RIF) contract to install and demonstrate Containerized Tethered Elevated Payload (C-TEP) functionality on Overlord Prototype. MUSV autonomy development. Complete SBIR Phase III documentation required for C-TEP					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>production award in FY23. Conduct Source Selection and award contract for C-TEM via PEO USC IDIQ MAC. Experimentation support that is platform specific is being realigned to the MUSV and LUSV projects.</p> <p>FY 2023 Base Plans: C4I (WBS 2.0) - Unmanned communication development and testing will continue as well as unmanned cryptographic development. ICS (WBS 3.0) - ICS development work will commence in this project in the form of integrating and transferring data obtained from a USV into ICS for use by a US Navy combatant. CCS (WBS 4.0) - Continued development efforts incorporating lessons learned from experimentation and demonstrations. Autonomy/perception/data (WBS 5.0) - Finalize refactoring of autonomy software and begin extensive testing to identify/fix capability gaps in meeting the minimum Technology Readiness Level requirements of the 2019 and 2021 National Defense Authorization Acts (NDAAs). Sensor and perception development and testing will continue to support the requirements of the NDAAs. The RAIL will continue to be expanded to accommodate new users. Prototyping (WBS 6.0) - This program element will acquire two C-TEP payloads and one C-TEM payload. In addition, this program element will begin the transition of additional an Office of Naval Research Future Naval Capability payload called Amon Hen.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase in funding from FY22 to FY23 is due to the increased development of sensor payloads, the addition of common core ICS work that supports both LUSV and MUSV, and an increase in software autonomy development and testing.</p>					
<p>Title: Support</p> <p align="right">Articles:</p> <p>FY 2022 Plans: Autonomy/perception/data (WBS 5.0) - Efforts will continue on the development of UMAA standards, autonomy Interface Control Documents (ICDs), and common control systems. Prototyping (WBS 6.0) - Land-based USV Operations Centers will be established and support for USV squadron operations will continue.</p> <p>FY 2023 Base Plans: Autonomy/perception/data (WBS 5.0) - Efforts will continue on the development of UMAA standards, autonomy Interface Control Documents (ICDs), and common control systems. Maintenance of Command and Control</p>	0.000	31.470	19.310	0.000	19.310
	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
software (i.e., CCS) will continue. Prototyping (WBS 6.0) - Land-based USV Operations Centers will be completely established and operational and support for USV squadron operations will continue. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The decrease in funding from FY22 to FY23 is due to the decreased funding needs in establishing the USV Operations Centers and fewer contracting actions.					
Title: Management Services Articles:	0.000	4.167	4.250	0.000	4.250
FY 2022 Plans: Continue to provide oversight and management of product development and support efforts. Continue program management activities and management for the production of the prototype modular payloads awarded in FY2022. Continue coordination with and across supporting activities (e.g., PEO IWS, PEO C4I, DARPA, OSD SCO, ONR, warfare centers, labs, and industry partners) to address requirements, manage funding, and execute plans. Continue to develop and refine required acquisition documents and artifacts that support required capabilities managed under this project. .	-	-	-	-	-
FY 2023 Base Plans: Continue to provide oversight and management of product development and support efforts. Continue program management activities and management for the production of the prototype modular payloads awarded in FY2023. Continue coordination with and across supporting activities (e.g., PEO IWS, PEO C4I, DARPA, OSD SCO, ONR, warfare centers, labs, and industry partners) to address requirements, manage funding, and execute plans. Continue to develop and refine required acquisition documents and artifacts that support required capabilities managed under this project.					
FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The increase in funding from FY22 to FY23 is consistent with inflation and reflects an ongoing need to prudently manage execution of funding.					
Accomplishments/Planned Programs Subtotals	0.000	119.560	181.620	0.000	181.620

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RD TEN/0603178N/3067: <i>Unmanned Surface Vehicle Enabling Capabilities</i>	21.681	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.681
• RD TEN/0603178N/3066: <i>Large Unmanned Surface Vessel (LUSV)</i>	67.517	144.846	146.840	-	146.840	125.501	122.643	123.302	128.796	Continuing	Continuing
• RD TEN/0605512N/3428: <i>Medium Unmanned Surface Vehicle (MUSV)</i>	53.402	60.028	104.000	-	104.000	93.809	98.894	97.757	99.229	Continuing	Continuing

Remarks

D. Acquisition Strategy

USV Enabling Capabilities efforts will accelerate future capability and support steady growth of the Navy's Unmanned Surface Vehicle (USV) Family of Systems (FoS). This will occur by leveraging efforts from the Department of Defense Research and Development Enterprise and industry for associated technologies and payloads and integrating them into USVs at the appropriate level of technical maturity. Coordination with UxS platforms will eliminate redundant efforts, encourage innovation and improve coordination of unmanned systems across multiple domains. Leveraging Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO)-developed standalone capabilities, the plan is to develop these capabilities for the initial prototype USVs and then transition those capabilities into Program of Record USVs through incremental development and integration across the funding portfolio. The Navy will accomplish efforts under USV Enabling Capabilities through existing contract vehicles prepared for OSD SCO and Office of Naval Research (ONR) efforts, the USV FoS Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) which was awarded in FY 2020, the prime contract awarded for MUSV design and fabrication, existing contracts for payload fabrication, and future contracts for further software development and maintenance.

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Services	WR	Various : Various	0.000	0.000		1.690	Oct 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Elevated Sensors	C/CPIF	TBD : TBD	0.000	0.000		5.500	Mar 2022	7.000	Dec 2022	-		7.000	Continuing	Continuing	Continuing
Unmanned Communications	Various	TBD : TBD	0.000	0.000		25.500	Mar 2022	38.960	Oct 2022	-		38.960	Continuing	Continuing	Continuing
Unmanned Cryptographic Systems	Various	Various : Various	0.000	0.000		5.000	Mar 2022	5.100	Oct 2022	-		5.100	Continuing	Continuing	Continuing
USV Machinery Qualification	C/CPIF	TBD : TBD	0.000	0.000		21.733	Mar 2022	0.000		-		0.000	0.000	21.733	-
Low TRL Autonomy	Various	Various : Various	0.000	0.000		18.500	Nov 2021	28.860	Oct 2022	-		28.860	0.000	47.360	-
Rapid Autonomy Integration Laboratory (RAIL)	Various	Various : Various	0.000	0.000		5.000	Dec 2021	7.520	Oct 2022	-		7.520	0.000	12.520	-
Sensors and Perceptions	WR	Various : Various	0.000	0.000		1.000	Dec 2021	3.040	Oct 2022	-		3.040	0.000	4.040	-
ICS Development	WR	Various : Various	0.000	0.000		0.000		52.000	Oct 2022	-		52.000	0.000	52.000	-
Amon Hen (N96C&F)	WR	Various : Various	0.000	0.000		0.000		15.580	Oct 2022	-		15.580	0.000	15.580	-
Subtotal			0.000	0.000		83.923		158.060		-		158.060	Continuing	Continuing	N/A

Remarks
Project Moved from Program Element 0603178N

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Autonomy Standrads (UMAA)	Various	Various : Various	0.000	0.000		1.000	Oct 2021	1.020	Oct 2022	-		1.020	Continuing	Continuing	Continuing
Command and Control (C2) Integration	Various	Various : Various	0.000	0.000		2.400	Oct 2021	3.450	Oct 2022	-		3.450	Continuing	Continuing	Continuing
USV Squadron Operations	WR	Various : Various	0.000	0.000		7.000	Oct 2021	7.140	Oct 2022	-		7.140	Continuing	Continuing	Continuing
Delta Requirements RFP Development Evaluation	WR	Various : Various	0.000	0.000		1.870	Oct 2021	0.000		-		0.000	Continuing	Continuing	Continuing

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
RFP Development	WR	Various : Various	0.000	0.000		0.500	Dec 2021	0.000		-		0.000	Continuing	Continuing	Continuing
USV Operations Center (UOC)	WR	Various : Various	0.000	0.000		18.700	Nov 2021	7.700	Oct 2022	-		7.700	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		31.470		19.310		-		19.310	Continuing	Continuing	N/A

Remarks
Project Moved from Program Element 0603178N

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	Various	Various : Various	0.000	0.000		4.167	Oct 2021	4.250	Oct 2022	-		4.250	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		4.167		4.250		-		4.250	Continuing	Continuing	N/A

Remarks
Project Moved from Program Element 0603178N

Project Cost Totals	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
	0.000	0.000	119.560	181.620	-	181.620	Continuing	Continuing	N/A

Remarks

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

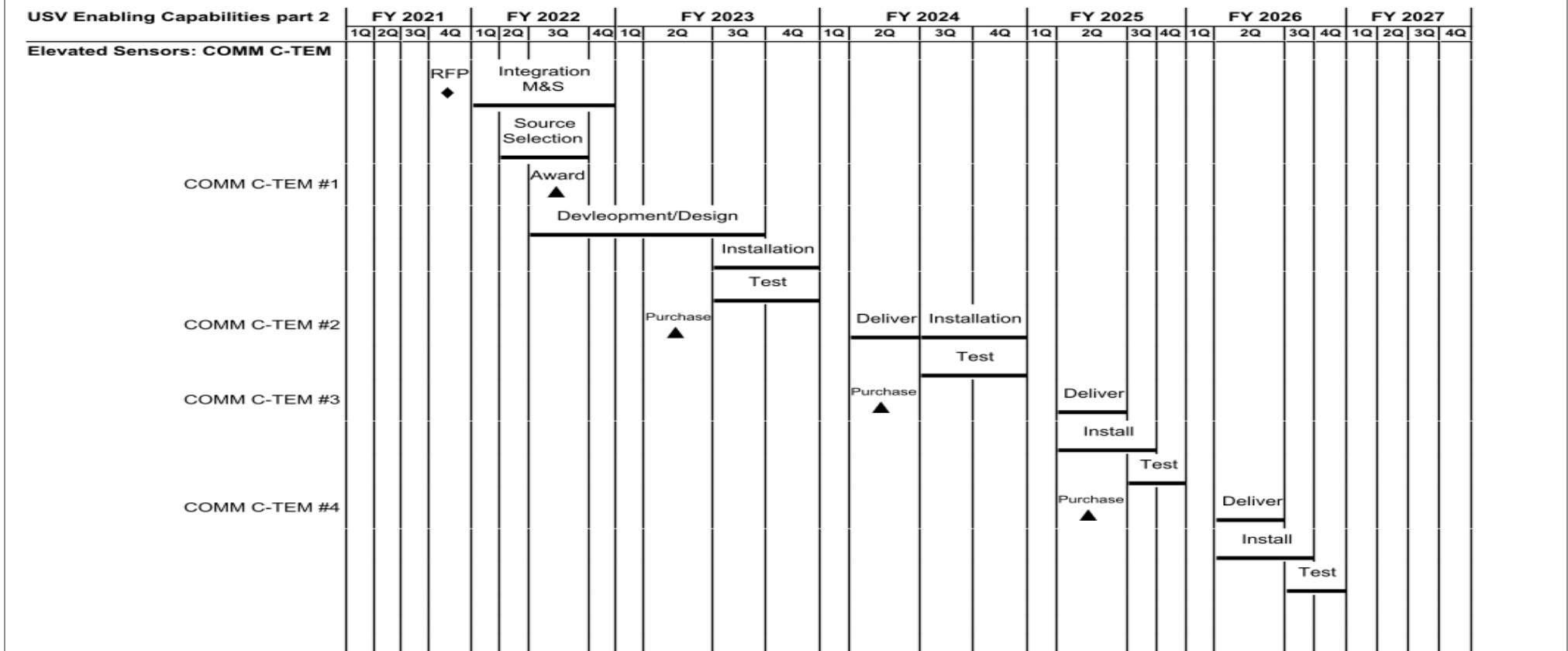
USV Enabling Capabilities	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Project Moved from PE 0603178N					■																											
Autonomy																																
UMAA ICD Development					ICD Development and Delivery																											
UMAA ICD Spiral Development & Reference Implementation					Spiral Dev & Ref Implementation																											
Low TRL Function Development					Low TRL Function Development																											
Platform Autonomy Development and Support					Platform Autonomy Development and Support																											
Platform Autonomy Management					Platform Autonomy Management																											
Data Management Infrastructure					Data Management Infrastructure																											
Unmanned Communications Development					Unmanned Communications Development																											
Unmanned Cryptographic Systems					Unmanned Cryptographic Systems																											
Command and Control (C2)					CCS Spiral Development																											
USV Operations Center					Establishment				Sustainment																							

2023PB - 0605513N - 3067

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---



2023PB - 0605513N - 3067

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

USV Enabling Capabilities part 3	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Elevated Sensors: PAYLOAD C-TEP																																
Award ▲ Install																																
Install C-TEP (RIF Prototype) on OUSV																																
Demonstrate C-TEP (RIF Prototype) on OUSV																																
Test Production Unit																																
Procure (1) Production Unit																																
Install and Test Production Unit																																
Procure (1) Production Unit																																
Install and Test (1) Production Unit																																
Procure (2) Production Units																																
Install and Test (2) Productions Units																																
USV Squadron																																

2023PB - 0605513N - 3067

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

USV Enabling Capabilities part 4	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027															
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q												
USV Machinery Qualification Contracts																																								
									Qualification Contracts																															
ICS development																																								
									ICS development																															
Amon Hen																																								
									Development																															
									Delivery One Exercise				Delivert Two Exercise				Major Exercise 1				Major Exercise 2				Major Exercise 3															

2023PB - 0605513N - 3067

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Navy		Date: April 2022
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
USV Enabling Capabilities				
Project Moved from PE 0603178N: New PE	1	2022	1	2022
Autonomy: UMAA ICD Development: ICD Development & Delivery	1	2022	2	2022
Autonomy: UMAA ICD Spiral Development & Reference Implementation: UMAA ICD Spiral Development & Reference Implementation	1	2022	4	2026
Autonomy: Low TRL Function Development: Low TRL Function Development	1	2022	4	2024
Autonomy: Platform Autonomy Development and Support: Platform Autonomy Development and Support	2	2022	4	2026
Autonomy: Platform Autonomy Development and Support: Platform Autonomy Management	4	2022	4	2026
Autonomy: Platform Autonomy Development and Support: Data Management Infrastructure	1	2022	4	2026
Unmanned Communications Development: Unmanned Communications Development	1	2022	4	2026
Unmanned Cryptographic Systems: Unmanned Cryptographic Systems	1	2022	4	2024
Command and Control (C2): CCS Spiral Development	1	2022	4	2024
USV Operations Center: Establishment	2	2022	4	2022
USV Operations Center: Sustainment	4	2022	4	2026
USV Enabling Capabilities part 2				
Elevated Sensors: COMM C-TEM: Integration Modeling and Simulation	1	2022	4	2022
Elevated Sensors: COMM C-TEM: RFP Release	4	2021	4	2021
Elevated Sensors: COMM C-TEM: Source Selection	2	2022	3	2022
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Award	3	2022	3	2022
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Development/Design	3	2022	3	2023

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities
--	--	---

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Installation	3	2023	4	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Test	3	2023	4	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: (1) Unit Purchase	2	2023	2	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Unit Delivered	2	2024	2	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Installation	3	2024	4	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Test	3	2024	4	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: (1) Unit Purchase	2	2024	2	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Unit Delivered	2	2025	2	2025
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Installation	2	2025	3	2025
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Test	3	2025	4	2025
Elevated Sensors: COMM C-TEM: COMM C-TEM #4: (2) Units Purchase	2	2025	2	2025
Elevated Sensors: COMM C-TEM: COMM C-TEM #4: Units Delivered	2	2026	2	2026
Elevated Sensors: COMM C-TEM: COMM C-TEM #4: Installation	2	2026	3	2026
Elevated Sensors: COMM C-TEM: COMM C-TEM #4: Test	3	2026	4	2026
USV Enabling Capabilities part 3				
Elevated Sensors: PAYLOAD C-TEP: Award (1) Production Units	3	2022	3	2022
Elevated Sensors: PAYLOAD C-TEP: Install C-TEP (RIF Prototype) on OUSV: Install C-TEP (RIF Prototype) on OUSV	3	2022	3	2022
Elevated Sensors: PAYLOAD C-TEP: Demonstrate C-TEP (RIF Prototype) on OUSV: Demonstrate C-TEP (RIF Prototype) on OUSV	3	2022	3	2022
Elevated Sensors: PAYLOAD C-TEP: Test Production Unit: Test Production Unit	3	2023	4	2023
Elevated Sensors: PAYLOAD C-TEP: Procure (1) Production Unit: Procure (1) Production Unit	2	2023	2	2023
Elevated Sensors: PAYLOAD C-TEP: Install and Test Production Unit: Install and Test Production Unit	2	2024	3	2024
Elevated Sensors: PAYLOAD C-TEP: Procure (1) Production Unit: Procure (1) Production Units	2	2024	2	2024

UNCLASSIFIED

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

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605513N / <i>UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES</i>	Project (Number/Name) 3067 / <i>Unmanned Surface Vehicle Enabling Capabilities</i>
--	---	--

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Elevated Sensors: PAYLOAD C-TEP: Install and Test (1) Production Unit: Install and Test (1) Production Unit	2	2025	3	2025
Elevated Sensors: PAYLOAD C-TEP: Procure (2) Production Units: Procure (2) Production Units	2	2025	2	2025
Elevated Sensors: PAYLOAD C-TEP: Install and Test (2) Productions Units: Install and Test (2) Productions Units	2	2026	3	2026
USV Squadron: Common Support	1	2022	4	2026
<i>USV Enabling Capabilities part 4</i>				
USV Machinery Qualification Contracts: Qualification Contracts	3	2022	2	2026
ICS development: ICS development	1	2023	4	2026
Amon Hen: Development (FY22 Future Navy Capability)	1	2023	4	2027
Amon Hen: Delivery of first Rough Casper developmental unit & support one exercise	1	2023	4	2023
Amon Hen: Delivery of first Rough Casper developmental unit & support two exercise	1	2024	4	2024
Amon Hen: Support of Major Exercise 1 (Does not encompass acquisition)	1	2025	4	2025
Amon Hen: Support of Major Exercise 2 (Does not encompass acquisition)	1	2026	4	2026
Amon Hen: Support of Major Exercise 3 (Does not encompass acquisition)	1	2027	4	2027