Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy	Date: March 2024
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 0605513N *I UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	115.436	159.628	176.261	92.868	-	92.868	99.468	190.591	190.940	194.646	Continuing	Continuing
3067: *Unmanned Surface Vehicle Enabling Capabilities*	115.436	159.628	176.261	92.868	-	92.868	99.468	190.591	190.940	194.646	Continuing	Continuing

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy	Date: March 2024
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 0605513N *I UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	181.534	176.261	293.493	-	293.493
Current President's Budget	159.628	176.261	92.868	-	92.868
Total Adjustments	-21.906	0.000	-200.625	-	-200.625
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-16.157	0.000			
• SBIR/STTR Transfer	-5.749	0.000			
• Program Adjustments	0.000	0.000	-198.170	-	-198.170
• Rate/Misc Adjustments	0.000	0.000	-2.455	-	-2.455

Change Summary Explanation

Program Changes:
Technical: Not applicable
Schedule: Not applicable
Cost:
FY 2023: -$5.749M SBIR/STTR/FTT Assessment (SBIR); -$15.000M reprogramming; -$1.157M Miscellaneous Reprogramming
FY 2024: No Change
FY 2025: -198.170 development of BRSE (HF BLOS communications) and STtNG (SATCOM BLOS) for USVs will be shifted to later years, USV ICS Capability Bundle #5 and Capability Bundle #6, navigation efforts will be reduced, and autonomy development and correlated CCS capabilities will be reduced. As well as efforts to expand capabilities in the unmanned operations center for higher classification data will be eliminated; -$2.455M miscellaneous adjustments

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy											Date: March 2024	
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 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
3067: *Unmanned Surface Vehicle Enabling Capabilities*	115.436	159.628	176.261	92.868	-	92.868	99.468	190.591	190.940	194.646	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, noncombat payload development, 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 supports 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.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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, software modeling and simulation, and employ a Secure Development and Operations (DevSecOps) software pipeline to facilitate integration and ensure 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 noncombat 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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Product Development	138.068	148.325	78.668	0.000	78.668
Articles:	-	-	-	-	-
FY 2024 Plans: C4I (WBS 2.0) - Unmanned communication will focus on OQE for TRA. Unmanned communication Increment 2 development and testing will continue as well as unmanned cryptographic development. Systems engineering will continue to support cyber security requirements as contracts are awarded for Increment 2 unmanned variants prototype production. USV ICS (WBS 3.0) - USV ICS development work will continue in this project in the form of integrating and transferring data obtained from a USV into USV ICS for use by a US Navy combatant. ICS development will include the addition of TWS, TTWCS, and VLS in Capability Bundle #5 as well as ICS test events. Lessons learned aboard prototype vessels have informed USV navigation which will continue development for automated fault control. ICS efforts to include Capability Bundle #4 development and ICS End to End control testing. CCS (WBS 4.0) - Continued development and delivery efforts of CCS software in support of USV activities, including integration into C2 nodes ashore, CANES afloat, and USV afloat. Engaging fleet and other stakeholders with a human factors team to design and develop an operator workflow to support USV operations. Continued development and delivery efforts of CCS software in support of the small USVs, to include integration into Payload Control System (PCS), Unmanned Operation Center (UOC), and Expeditionary MCM deployments.					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Autonomy/perception/data (WBS 5.0) - Autonomy software testing to meet the minimum Technology Readiness Level requirements of the 2019 and 2021 National Defense Authorization Acts (NDAAs). Build and integrate a Government-owned software baseline, compatible to multiple platforms with common interfaces as defined by UMAA. The Blue release of the Government- owned software is on track for delivery by the end of FY24. Additionally, the autonomy software is on track to be integrated and tested on several small USVs. Sensor and perception prototyping, demonstration, and testing will continue to support the requirements of the NDAAs, and work will continue to develop perception algorithms necessary for autonomous navigation during EMCON The RAIL will support the development of the Government-owned software baseline in a Government-owned infrastructure. Prototyping (WBS 6.0) - Continue CTEM development and prepare for on water testing. Conduct CTEM on water operation from USV during C-TEM Pre-Delivery trials. Pre-delivery trial will test CTEM's ability to operate on a USV at sea, test Link-16 radio performance in accordance with base contract. For future payloads, utilize CTEM prototype to help define and standardize payload to USV autonomy behaviors, interface control requirements and documentation. , and Continue SAURON Software and hardware development for transition to a Program of Record (POR). Utilize Rough Casper on USV for fleet demonstration until 3QFY24. Rough Casper efforts will conclude in FY24. ***FY 2025 Base Plans:*** C4I (WBS 2.0) - Increment 2 will be the core focus for unmanned communication development. Capstone testing will continue for LOS and BLOS as well as unmanned cryptographic development. C4I increment 2 prototypes will be integrated into USV representative networks for integration as they are delivered. USV ICS (WBS 3.0) - USV ICS development work will continue in this project in the form of integrating and transferring data obtained from a USV into USV ICS for use by a US Navy combatant. ICS test events ahead of Capstone 4 will occur for data transfer supporting Capability Bundle development and LUSV representative systems that will interface ICS, C4I, and CCS. ICS Capability Bundle #6 will begin navigation integration and testing with ICS (WBS 5.0) - Autonomy software testing to meet the minimum Technology Readiness Level requirements of the 2019 and 2021 National Defense Authorization Acts (NDAAs). Build and integrate a Government-owned software baseline, compatible to multiple platforms with common interfaces as defined by UMAA. The lessons learned from on-water testing of the autonomy Blue release will be incorporated into the autonomy baseline and the work on the Black					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
release will begin. Sensor and perception will continue to develop an advanced set of sensors in support of ISR platforms. Establish and integrate a developmental Machine Learning Operations pipeline for delivering advanced perception algorithms to enable safe navigation for USV PORs. Develop perception algorithms that analyze camera data to enhance USV perception capabilities and integrate with autonomy software testing environments. Develop and integrate track server software to connect sensors to platform maneuvering autonomy. The RAIL will continue to expand automated testing capabilities for autonomy and support the development of the Government-owned software baseline in a government-owned infrastructure. Industry collaboration for UMAA standards and autonomy frameworks will continue to enable continuous development of use cases and framework models for platform-agnostic autonomy solutions. Prototyping (WBS 6.0) - FY 2024 TO FY 2025 ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** A decrease of $69.657M in FY 2025. The required development of BRSE (HF BLOS communications) and STtNG (SATCOM BLOS) for USVs will not be funded in FY 2025 and will be shifted to later years. The scope of USV ICS Capability Bundle #5 and Capability Bundle #6 will be reduced, with cyber and integration delayed to future years. Core Virtual Combat System Cabinets (VCSC) computing infrastructure work and any integration for autonomy, CCS, navigation, or expeditionary communications will not be funded. Navigation efforts will be reduced, with development of some unmanned navigation systems delayed to FY 2027. Additionally, the scope of autonomy development and correlated CCS capabilities will be reduced in FY 2025 resulting in a 16-month delay in the delivery of the Autonomy Baseline Black Release. Similarly, developing and testing perception systems for autonomous navigation under EMCON will be scaled back in FY 2025, leading to a one-year delay in their delivery. Moreover, budget reductions will prevent the procurement, integration, and testing of Elevated Sensors systems and reduce ability to develop common interface between Payloads and USV platforms.					
Title: Support	17.310	23.606	12.700	0.000	12.700

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Articles:	-	-	-	-	-
FY 2024 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 software (i.e., CCS) will continue. Updated CCS capabilities were tested in Q1FY24 during a Fleet exercise. CCS deployment on CANES via the Overmatch Software Armory is planned for initial demonstration in Q2FY24. CCS capabilities will be updated based on the latest UMAA release in support of small USVs and LUSV POR. Prototyping (WBS 6.0) - Integration of additional capabilities into the land-based USV Operations Center and support for USV squadron operations will continue. ***FY 2025 Base Plans:*** CCS (WBS 4.0) - This Program Element will establish a dedicated Software Support Activity (SSA) for CCS and support development efforts for several classes of USVs. By the end of FY25 CCS will be fully deployed on CANES via the Overmatch Software Armory. CCS capabilities will then further mature to support simultaneous deployment of multiple USVs. Autonomy/perception/data (WBS 5.0) - Efforts will continue on the development of UMAA standards, autonomy Interface Control Documents (ICDs), UMAA compliant component definitions, and common control systems. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** A decrease of $10.906M in FY 2025. In FY 2025, efforts associated with both design and procurement for the MILCON will be reduced, delaying its operationalization by 16 months. Additionally, efforts to expand capabilities in the unmanned operations center for higher classification data will be eliminated, as well as all efforts under the USV Squadron Operations line supporting Fleet Exercises and data collection.					
Title: Management Services	4.250	4.330	1.500	0.000	1.500
Articles:	-	-	-	-	-
FY 2024 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					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605513N / *UNMANNED SURFACE V EHICLE ENABLING CAPABILITIES*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
FY2024. 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 2025 Base Plans:*** Continue to provide oversight and management of product development and support efforts. 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 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** A decrease of $2.83M in FY 2025 due to reduced management of development activities. Payload development and the corresponding management will not occur in FY 2025. Overall development effort with PEO IWS, PEO C4I and other activities will be reduced, corresponding to less management activities.					
Accomplishments/Planned Programs Subtotals	159.628	176.261	92.868	0.000	92.868

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• RDTEN/0603178N/3066: *Large Unmanned Surface Vessel (LUSV)*	131.680	117.400	53.964	-	53.964	62.239	128.085	129.289	131.798	Continuing	Continuing
• RDTEN/0605512N/3428: *Medium Unmanned Surface Vehicle (MUSV)*	83.548	85.800	101.838	-	101.838	103.181	102.268	99.688	101.624	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

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
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*

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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Services	WR	Various : Various	1.690	0.000		0.000		0.000		-		0.000	0.000	1.690	-
Elevated Sensors	C/CPIF	GDMS : Fairfax, VA	5.500	7.000	Dec 2022	2.208	Aug 2024	0.000		-		0.000	Continuing	Continuing	Continuing
Unmanned Communications	Various	Variuos : Various	21.376	31.968	Oct 2022	37.801	Oct 2023	17.468	Oct 2024	-		17.468	Continuing	Continuing	Continuing
Unmanned Cryptographic Systems	Various	Various : Various	5.000	5.100	Oct 2022	5.200	Oct 2023	3.200	Oct 2024	-		3.200	Continuing	Continuing	Continuing
USV Machinery Qualification	C/CPIF	Various : Various	21.733	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Low TRL Autonomy	Various	Various : Various	18.500	28.860	Oct 2022	29.570	Oct 2023	15.500	Oct 2024	-		15.500	Continuing	Continuing	Continuing
Rapid Autonomy Integration Laboratory (RAIL)	Various	Various : Various	5.000	7.520	Oct 2022	6.300	Oct 2023	4.500	Oct 2024	-		4.500	Continuing	Continuing	Continuing
Sensors and Perceptions	WR	Various : Various	1.000	3.040	Oct 2022	4.200	Oct 2023	7.500	Oct 2024	-		7.500	Continuing	Continuing	Continuing
USV ICS Development	WR	Various : Various	0.000	42.000	Oct 2022	50.800	Oct 2023	30.500	Oct 2024	-		30.500	Continuing	Continuing	Continuing
Amon Hen (N96C&F)	WR	Various : Various	0.000	12.580	Oct 2022	12.246	Oct 2023	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	79.799	138.068		148.325		78.668		-		78.668	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Autonomy Standrads (UMAA)	Various	Various : Various	1.000	1.020	Oct 2022	2.500	Oct 2023	3.200	Oct 2024	-		3.200	Continuing	Continuing	Continuing
Command and Control (C2) Integration	Various	Various : Various	2.400	3.450	Oct 2022	4.566	Oct 2023	6.100	Oct 2024	-		6.100	Continuing	Continuing	Continuing
USV Squadron Operations	WR	Various : Various	7.000	5.140	Oct 2022	10.240	Oct 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Delta Requirements RFP Development Evaluation	WR	Various : Various	1.870	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
RFP Development	WR	Various : Various	0.500	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
USV Operations Center (UOC)	WR	Various : Various	18.700	7.700	Oct 2022	6.300	Oct 2023	3.400	Oct 2024	-		3.400	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy		Date: March 2024
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	31.470	17.310		23.606		12.700		-		12.700	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Various	4.167	4.250	Oct 2022	4.330	Oct 2023	1.500	Oct 2024	-		1.500	Continuing	Continuing	Continuing
		Subtotal	4.167	4.250		4.330		1.500		-		1.500	Continuing	Continuing	N/A

	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	115.436	159.628		176.261		92.868		-		92.868	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605513N / *UNMANNED SURFACE V EHICLE ENABLING CAPABILITIES*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

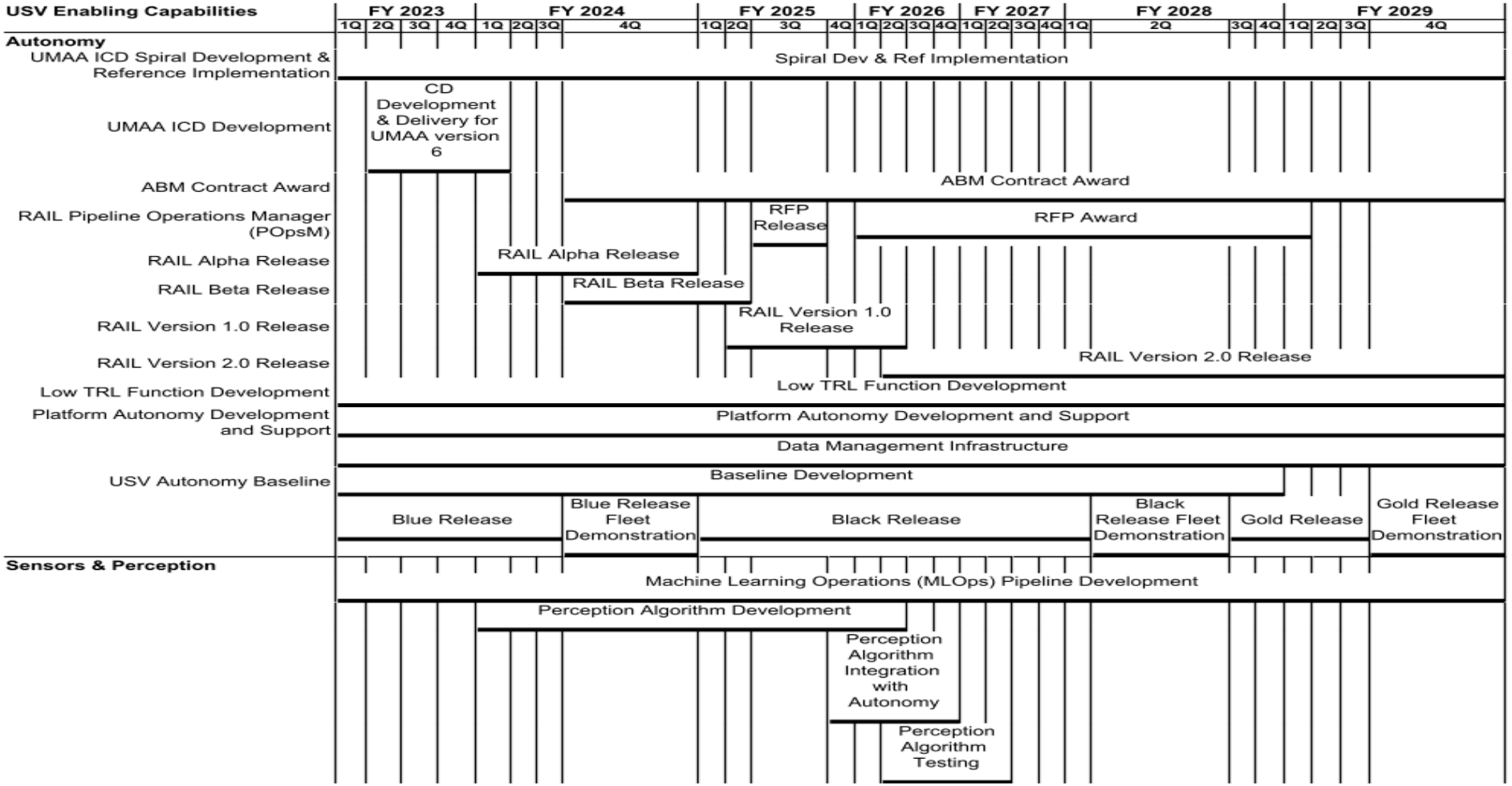
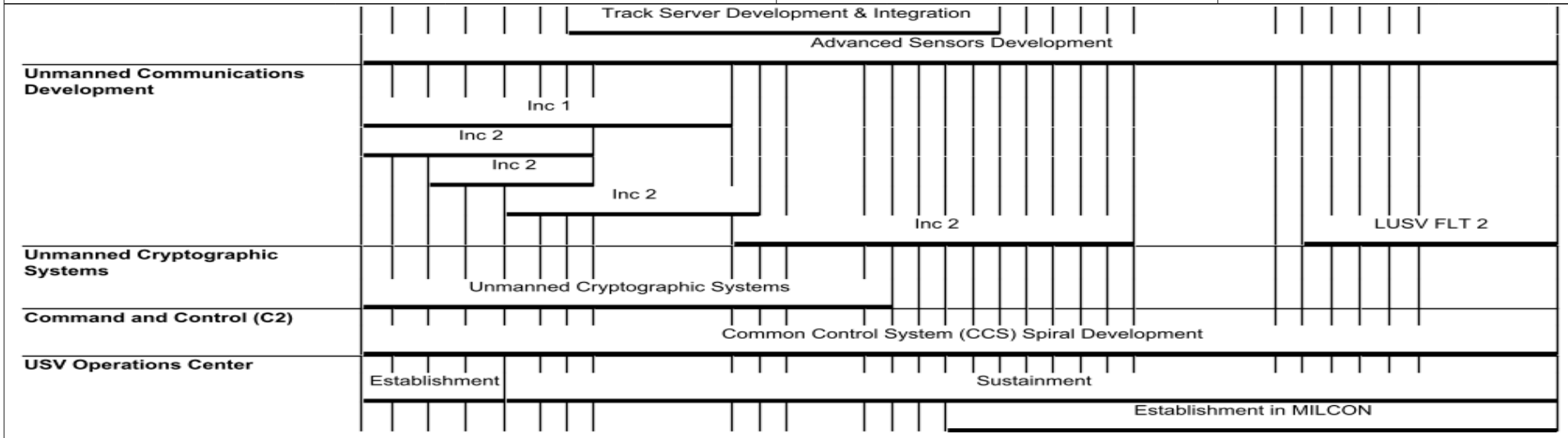
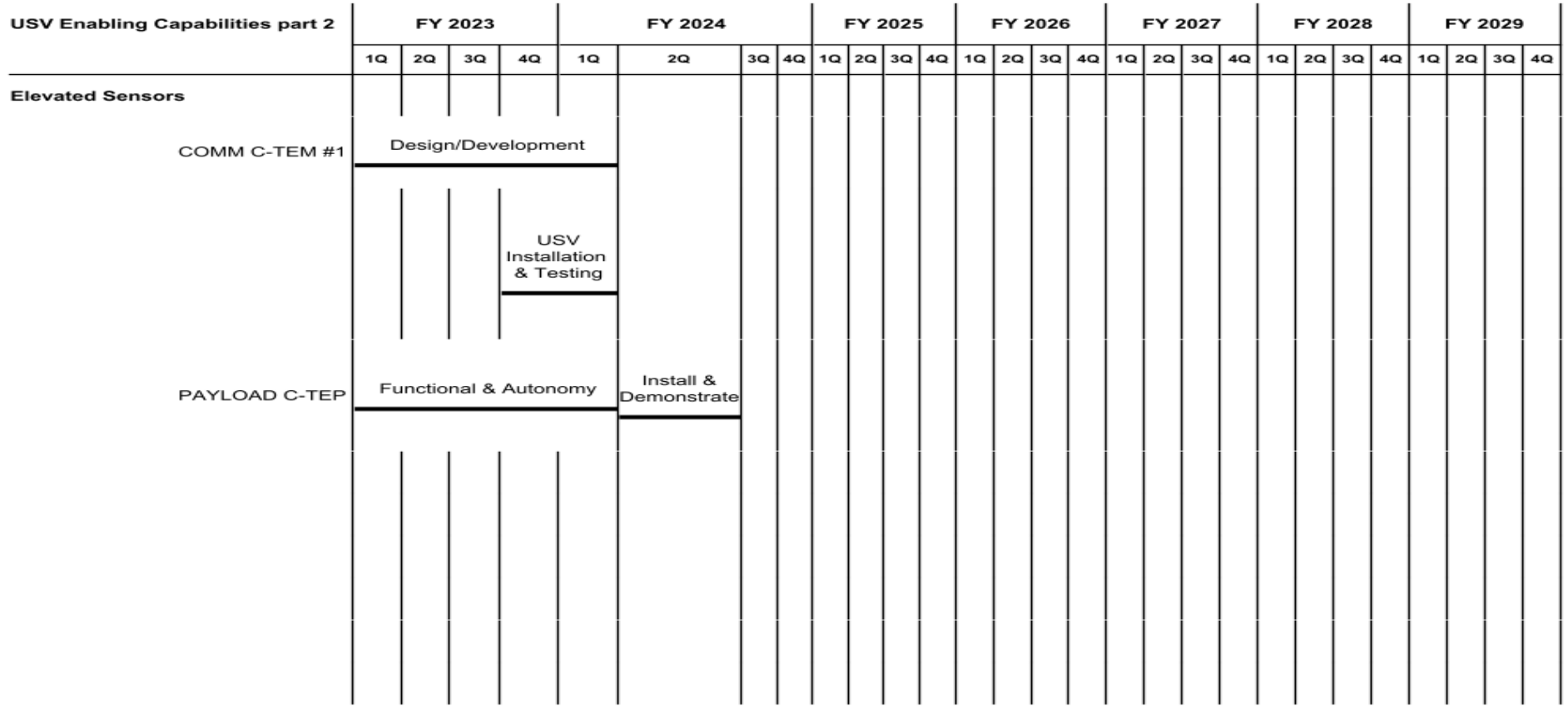


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0605513N / *UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*



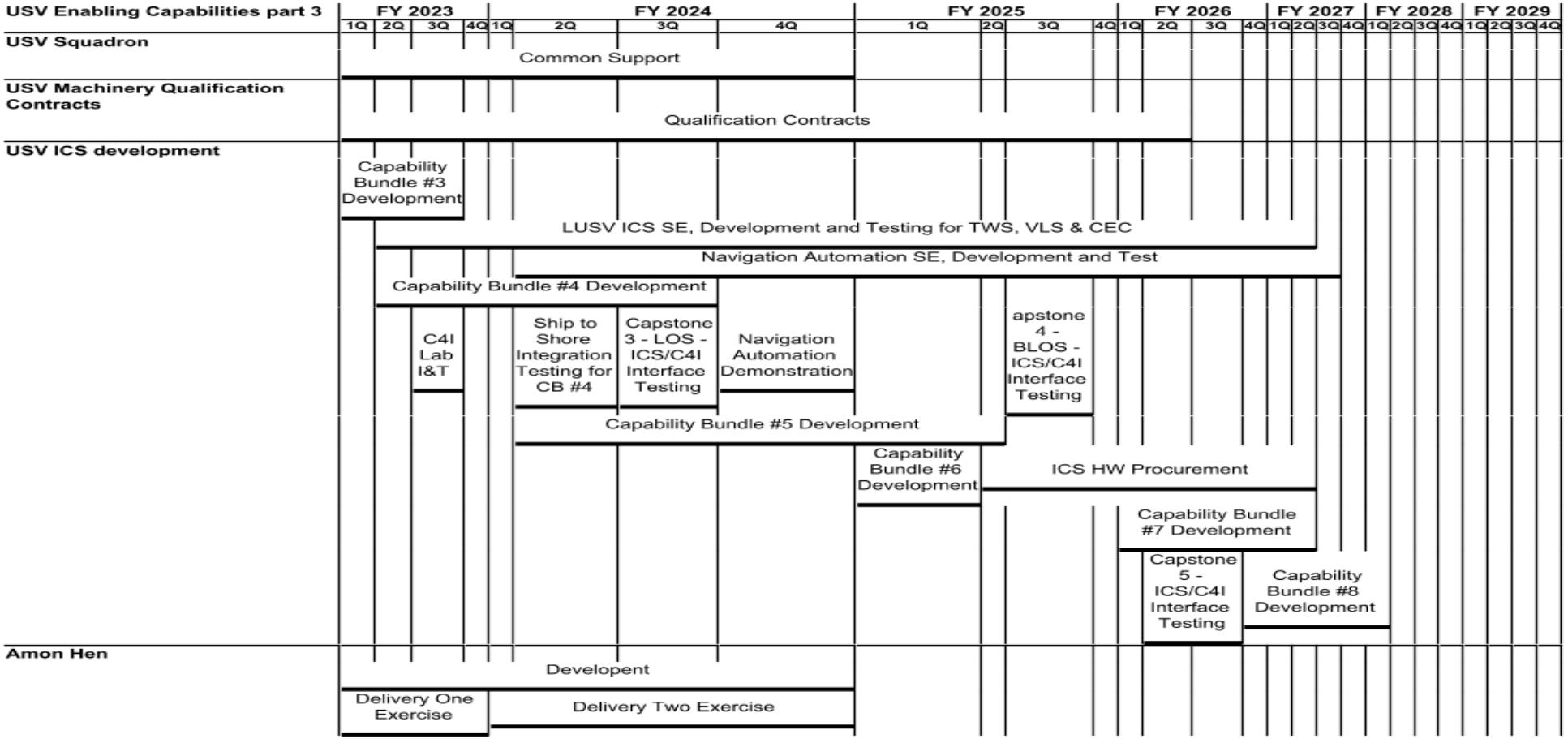
2025PB - 0605513N - 3067

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
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*



2025PB - 0605513N - 3067

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
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*



2025PB - 0605513N - 3067

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
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

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
USV Enabling Capabilities				
Autonomy: UMAA ICD Spiral Development & Reference Implementation: UMAA ICD Spiral Development & Reference Implementation	1	2023	4	2029
Autonomy: UMAA ICD Development: ICD Development & Delivery for UMAA version 6	2	2023	1	2024
Autonomy: ABM Contract Award: ABM Contract Award	4	2024	4	2029
Autonomy: RAIL Pipeline Operations Manager (POpsM): RFP Release	3	2025	3	2025
Autonomy: RAIL Pipeline Operations Manager (POpsM): RFP Award	1	2026	1	2029
Autonomy: RAIL Alpha Release: RAIL Alpha Release	1	2024	4	2024
Autonomy: RAIL Beta Release: RAIL Beta Release	4	2024	2	2025
Autonomy: RAIL Version 1.0 Release: RAIL Version 1.0 Release	2	2025	2	2026
Autonomy: RAIL Version 2.0 Release: RAIL Version 2.0 Release	2	2026	4	2029
Autonomy: Low TRL Function Development: Low TRL Function Development	1	2023	4	2029
Autonomy: Platform Autonomy Development and Support: Platform Autonomy Development and Support	1	2023	4	2029
Autonomy: Platform Autonomy Development and Support: Data Management Infrastructure	1	2023	4	2029
Autonomy: USV Autonomy Baseline: Baseline Development; Incremental Releases each quarter	1	2023	4	2028
Autonomy: USV Autonomy Baseline: Blue Release	1	2023	3	2024
Autonomy: USV Autonomy Baseline: Blue Release Fleet Demonstration	4	2024	4	2024
Autonomy: USV Autonomy Baseline: Black Release	1	2025	1	2028
Autonomy: USV Autonomy Baseline: Black Release Fleet Demonstration	2	2028	2	2028
Autonomy: USV Autonomy Baseline: Gold Release	3	2028	3	2029

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Autonomy: USV Autonomy Baseline: Gold Release Fleet Demonstration	4	2029	4	2029
Sensors & Perception: Machine Learning Operations (MLOps) Pipeline Development	1	2023	4	2029
Sensors & Perception: Perception Algorithm Development	1	2024	2	2026
Sensors & Perception: Perception Algorithm Integration with Autonomy	4	2025	4	2026
Sensors & Perception: Perception Algorithm Testing	2	2026	2	2027
Sensors & Perception: Track Server Development & Integration	3	2024	4	2026
Sensors & Perception: Advanced Sensors Development	1	2023	4	2029
Unmanned Communications Development: Increment 1 - TRA, OQE, Analysis, Assessments of Increment 2 C4I PoR Systems	1	2023	4	2024
Unmanned Communications Development: Increment 2 - Systems of Systems Development of C4I PoR Systems	1	2023	3	2024
Unmanned Communications Development: Increment 2 - System Requirements Development of C4I PoR Systems	3	2023	3	2024
Unmanned Communications Development: Increment 2 - System Design of C4I PoR Systems	1	2024	1	2025
Unmanned Communications Development: Increment 2 - System Development and Testing of C4I PoR Systems	1	2025	1	2028
Unmanned Communications Development: LUSV FLT 2 Development Systems of Systems	4	2028	4	2029
Unmanned Cryptographic Systems: Unmanned Cryptographic Systems	1	2023	4	2025
Command and Control (C2): CCS Spiral Development	1	2023	4	2029
USV Operations Center: Establishment	1	2023	4	2023
USV Operations Center: Sustainment	1	2024	4	2029
USV Operations Center: Establishment in MILCON	3	2026	4	2029
USV Enabling Capabilities part 2				
Elevated Sensors: COMM C-TEM #1: Design/Development	1	2023	1	2024
Elevated Sensors: COMM C-TEM #1: USV Installation & Testing	4	2023	1	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Elevated Sensors: PAYLOAD C-TEP: Functional & Autonomy D&T (RIF Prototype)	1	2023	1	2024
Elevated Sensors: PAYLOAD C-TEP: Install & Demonstrate (RIF Prototype) on OUSV	2	2024	2	2024
USV Enabling Capabilities part 3				
USV Squadron: Common Support	1	2023	4	2024
USV Machinery Qualification Contracts: Qualification Contracts	1	2023	2	2026
USV ICS development: Capability Bundle #3 Development	1	2023	3	2023
USV ICS development: LUSV ICS SE, Development and Testing for TWS, VLS & CEC	2	2023	2	2027
USV ICS development: Navigation Automation SE, Development and Test	2	2024	3	2027
USV ICS development: Capability Bundle #4 Development	2	2023	3	2024
USV ICS development: C4I Lab I&T	3	2023	3	2023
USV ICS development: Ship to Shore Integration Testing for CB #4	2	2024	2	2024
USV ICS development: Capstone 3 - LOS - ICS/C4I Interface Testing	3	2024	3	2024
USV ICS development: Navigation Automation Demonstration	4	2024	4	2024
USV ICS development: Capstone 4 - BLOS - ICS/C4I Interface Testing	3	2025	3	2025
USV ICS development: Capability Bundle #5 Development	2	2024	2	2025
USV ICS development: ICS HW Procurement	2	2025	2	2027
USV ICS development: Capability Bundle #6 Development	1	2025	1	2025
USV ICS development: Capability Bundle #7 Development	1	2026	2	2027
USV ICS development: Capstone 5 - ICS/C4I Interface Testing	2	2026	3	2026
USV ICS development: Capability Bundle #8 Development	4	2026	1	2028
Amon Hen: Development (FY22 Future Navy Capability)	1	2023	4	2024
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