Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy											Date: March 2019	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603502N *I Surface & Shallow Water MCM*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	244.710	69.906	120.348	507.000	-	507.000	813.251	848.933	955.274	872.229	Continuing	Continuing
1234: *Unmanned Surface Vehicle (USV)*	88.290	14.989	28.645	31.519	-	31.519	19.105	18.943	19.331	19.715	Continuing	Continuing
2989: *Barracuda*	0.000	20.572	28.803	28.641	-	28.641	33.205	38.387	37.869	38.631	Continuing	Continuing
3066: *Large Unmanned Surface Vehicle (LUSV)*	0.000	0.000	0.000	372.527	-	372.527	535.364	584.323	607.616	637.984	Continuing	Continuing
3067: *Unmanned Surface Vehicle Enabling Capabilities*	0.000	0.000	0.000	50.413	-	50.413	199.277	177.280	247.458	132.039	Continuing	Continuing
3123: *SMCM UUV*	156.420	21.799	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	178.219
3428: *Medium Unmanned Surface Vehicle (MUSV)*	0.000	0.000	2.800	23.900	-	23.900	26.300	30.000	43.000	43.860	Continuing	Continuing
9999: *Congressional Adds*	0.000	12.546	60.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	72.646

Note

FY 2018 and future funding for Projects 0530, 1233, and 1235 were realigned to PE 0604127N; Project 2094 to PE 0604031N; and Project 2131 to PE 0604126N.
FY 2019 and future funding for Project 3123 is realigned to PE 0604028N.

A. Mission Description and Budget Item Justification

This program element provides resources for development of mine countermeasures systems to provide minehunting, minesweeping, and neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and minesweeping operations worldwide. Resources are for developing and deploying advanced minehunting and minesweeping systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Core capabilities include forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance and disaster response to maintain freedom of the seas. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, reducing or eliminating post-mission analysis detect, classify, identify, decide time, improving neutralization time, improving network communications, automatic target recognition, and achieving in-stride detect-to-engage capability. Concept of operations includes development of cooperative, unmanned, modular systems; the establishment of a capable networked command and control systems; and standing up an accurate and interactive environmental system with the ability to form and disseminate a Common Environmental Picture. Efforts benefit the Mine Countermeasure (MCM) force by transforming the Navy from the platform-centered legacy set of systems to a capability-centered force that is distributed, networked, and able to provide unique maritime influence and access across the entire maritime domain.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603502N *I Surface & Shallow Water MCM*

The Surface Mine Countermeasures (SMCM) programs are in general platform independent and will provide detection, classification, localization, identification, neutralization, and influence clearance capabilities. Programs develop: (1) unmanned minehunting capability for surface platforms; (2) the integration and improvement of new and existing systems (3) support for systems which detect, localize, classify, identify, and neutralize all mine types across MCM Avenger Class and other platforms; (4) systems for neutralizing mines and light obstacles through the entire water column to include deep water, open water, shallow water, very shallow water, surf zones, and beach landing craft zones in support of operations; (5) integrate hardware for experimental testing related to surface ship, aircraft, and other cross platform applications; and (6) provide for the future unmanned portion of the FSC strategy.

Medium Unmanned Surface Vehicles (MUSVs) and Large Unmanned Surface Vessels (LUSVs) are segments of the Navy's Unmanned Surface Vehicle Family of Systems (FoS). MUSV is defined as having a reconfigurable mission capability which is accomplished via modular payloads with an initial mission capability to support Battlespace Awareness through Intelligence, Surveillance and Reconnaissance (ISR) and Electronic Warfare (EW). LUSV is defined as having a reconfigurable, multi-mission capability which is accomplished via an organic warfare capability and may be augmented with additional modular payloads. Initial LUSV missions include Anti-Surface Warfare (ASuW) and Strike. MUSVs and LUSVs provide low cost, high endurance, reconfigurable ships able to accommodate various payloads for unmanned missions and augment the Navy's manned surface force. MUSVs and LUSVs will be capable initially of semi-autonomous operation, with operators in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via the afloat element (i.e., embarked on a United States Navy (USN) combatant/support ship) or via the ashore element (C2 station ashore). While MUSV and LUSV will logically share common (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 as driven by payload capability, capacity and LUSV's organic warfare capability.

Future missions for both MUSV and LUSV will be informed by the Navy's Future Surface Combatant Force (FSCF) Analysis of Alternatives (AoA) and as future payloads and concept of operations (CONOPs) are developed. Under the FSCF, MUSV and LUSV will be referred to as Future Surface Combatant USVs (FSC USVs) and are projected to include missions for Anti-Submarine Warfare (ASW), Logistics, Mine Countermeasures (MCM), Counter Swarm, Armed Escort, and Mine Warfare (i.e., mining). MUSV and LUSV are key enablers of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy (alone or in teams/swarms), team with individual manned combatants or augment battle groups. Fielding of MUSV and LUSV will provide the Navy increased capability and necessary capacity at lower procurement and sustainment costs, reduced risk to sailors and increased readiness by offloading missions from manned combatants.

While unmanned surface vehicles are new additions to fleet units, MUSV and LUSV are intended to be relatively low developmental technologies that combine robust and proven commercial vessel designs with existing military payloads to rapidly and affordably expand the capacity and capability of the surface fleet. Both programs benefit from 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) and Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter (FY 2017 to FY 2021) and Office of the Secretary of Defense Strategic Capabilities Office (OSD SCO) Ghost Fleet Overlord Large USV experimentation effort (FY 2018 to FY 2021). The combination of fleet-ready C2 solutions developed by the Ghost Fleet Overlord program and initial 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. Fleet learning with early MUSV and LUSV units plus future upgrades of more advanced autonomy technology will allow eventual deployment as fully autonomous vehicles.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603502N *I Surface & Shallow Water MCM*

These efforts are broken out into three (3) Project Units (PUs): Medium Unmanned Surface Vehicle (MUSV) (Project 3428), Large Unmanned Surface Vessel (LUSV) (Project 3067) and Unmanned Surface Vessel Enabling Capabilities (Project 3066).

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	154.117	62.727	76.052	-	76.052
Current President's Budget	69.906	120.348	507.000	-	507.000
Total Adjustments	-84.211	57.621	430.948	-	430.948
• Congressional General Reductions	-	-0.482			
• Congressional Directed Reductions	-	-1.997			
• Congressional Rescissions	-	-			
• Congressional Adds	-	60.100			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.025	0.000			
• Program Adjustments	0.000	0.000	432.400	-	432.400
• Rate/Misc Adjustments	0.000	0.000	-1.452	-	-1.452
• Congressional General Reductions Adjustments	-0.216	-	-	-	-
• Congressional Directed Reductions Adjustments	-94.970	-	-	-	-
• Congressional Add Adjustments	13.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 9999: *Congressional Adds*		
Congressional Add: *Unmanned Influence Sweep System*	12.546	0.000
Congressional Add: *Medium Displacement Unmanned Surface Vehicle*	0.000	42.000
Congressional Add: *Navy Identified MCM USV Requirement*	0.000	14.100
Congressional Add: *Navy Identified UISS Requirement*	0.000	4.000
Congressional Add Subtotals for Project: 9999	12.546	60.100
Congressional Add Totals for all Projects	12.546	60.100

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603502N *I Surface & Shallow Water MCM*

Change Summary Explanation

FY 2020 funding request was reduced by $3.300 million to account for the availability of prior year execution balances.

Program Adjustments:
FY18: -$84,211K total adjustments; Congressional program adjustments: -$8,000K MCM USV, -$2,260K Knifefish, +$13,000K UISS; Congressional realignments: -$12,900K Projects 0530, 1233, 1235, -$11,623K Project 2131, -$60,187K Project 2094; SBIR -$2,025K; Other Rate Adjustments: -$216K FFRDC.
FY19: +$60,100K Congressional program adjustments: +$14,100K MCM USV, +$42,000K MUSV, +$4,000K UISS, -$1,997K Barracuda schedule delays; -$482K FFRDC
FY20: -$3,300K Under execution reduction; -$1,142K NWCF rate adjustments; -$310K Contract Services Reform reduction; +$424,000K Unmanned Surface Vessel program adjustment; +$11,700K MCM USV program adjustment

Technical: Not applicable.

Schedule: FY18: -$8,000K Congressional program adjustment resulted in the slowing down of efforts related to deploy and retrieve (D&R) payload integration in FY18, resulting in overall schedule slip for the MCM USV program of approximately eight months.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
1234: *Unmanned Surface Vehicle (USV)*	88.290	14.989	28.645	31.519	-	31.519	19.105	18.943	19.331	19.715	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY 2018, the Unmanned Influence Sweep System (UISS) received a Congressional Add of $13.000M in Project Unit 9999/C401. In FY 2019, UISS received a Congressional Add of $4.000M in Project Unit 9999/C444. In FY 2019, MCM USV received a Congressional Add of $14.100M in Project Unit 9999/C443.

A. Mission Description and Budget Item Justification

This project provides resources for development, improvement and integration of Unmanned Surface Vehicle (USV) Mine Countermeasure (MCM) systems. A description of the major planned programs includes the following:

1) The Unmanned Influence Sweep System (UISS) utilizes an Unmanned Surface Vehicle (USV) integrated with an Unmanned Surface Sweep System (US3), a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines, which can be deployed from the Littoral Combat Ship (LCS) or a Vessel of Opportunity (VOO).

2) Mine Hunting USVs (MHUs) were delivered in FY 2014 to 5th Fleet in response to an Urgent Operational Need (UON) from Naval Forces Central Command concerning MCM capacity and capability gaps. Four systems (referred to as MHUs 1-4) were provided to Combined Task Force (CTF) 52 to conduct Minehunting Operations. Each MHU consists of a USMI Naval Special Warfare (NSW) 11-meter Rigid Hull Inflatable Boat (RHIB), which was converted to a USV by Naval Undersea Warfare Center Division Newport, and tows an AN/AQS-24B Minehunting sonar. The systems are controlled from a Command and Control (C2) container located on either an underway host platform or on pier-side. MHUs 1-4 are currently in sustainment and will support CTF52 until MCM Mission Packages are deployed to C5F AOR. In FY 2016-2017, Speed to Fleet (S2F) funding supported the design and fabrication of an additional minehunting asset (referred to as "MHU 5") based on the MCM USV craft and integrating the AQS-24B. Beyond FY 2017, all future efforts with MHU 5 are within the MCM USV program.

3) The Mine Countermeasures Unmanned Surface Vehicle (MCM USV) program leverages the USV from the UISS Program of Record (PoR) and adds a modular mission capability through the addition of multiple payloads. MCM USV w/ AQS-20C integrates the existing AQS-20C minehunting sonar. MCM USV w/ AQS-24B continues the Minehunting efforts. In FY 2019 the MCM USV program began initial design efforts to support integration with a Mine Neutralization capability (Barracuda). Minesweeping payloads will be subsumed by the MCM USV PoR in FY 2020.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: UISS Product Development	2.294	1.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: -Complete UISS DT, complete UISS Operational Assessment (OA), and achieve Milestone C, which is now anticipated in 3Q FY 2019. - Develop Engineering Change Proposals (ECPs) for EDM and Low Rate Initial Production (LRIP) units in preparation for integration testing and Initial Operational Test and Evaluation (IOT&E). - Conduct systems engineering efforts in support of program and test efforts. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY 2019 to FY 2020 due to UISS program being subsumed by the MCM USV program in FY 2020.					
Title: UISS Support	0.000	1.250	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2019 Plans: - Support engineering, management and logistics efforts for MS C in 3Q FY 2019 and Initial Operational Capability (IOC) in 4Q FY 2019. - Prepare for IOT&E. - Continue development of Full Rate Production (FRP) documentation to release Request for Proposal (RFP) in late FY 2019. - Support LCS Integration and MCM Mission Package (MP) testing. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding decreased from FY 2019 to FY 2020 due to UISS program being subsumed by the MCM USV program in FY 2020.					
Title: UISS Test and Evaluation	0.000	1.625	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2019 Plans: - Complete UISS DT and OA in support of MS C decision in 3Q FY 2019. - Conduct UISS system level IOT&E in support of FRP decision planned for FY 2020. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY 2019 to FY 2020 due to UISS program being subsumed by the MCM USV program in FY 2020.					
Title: UISS Management Services	0.000	0.131	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2019 Plans: - Oversee ongoing contractor efforts. - Manage MS C documentation completion. - Manage FRP RFP release and proposal evaluation. ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY 2019 to FY 2020 due to UISS program being subsumed by the MCM USV program in FY 2020.					
Title: MHU Support	0.288	0.900	0.913	0.000	0.913

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:	-	-	-	-	-
FY 2019 Plans: - Provide program management, engineering and logistics support for production improvements to forward-deployed MHU 1-4 USVs and C2 Station. Maintain Cybersecurity compliance of system via a software baseline update developed and installed on fielded USVs and C2 container. ***FY 2020 Base Plans:*** - Provide program management, engineering and logistics support for product improvements to forward-deployed MHU 1-4 USVs and C2 Station. Maintain Cybersecurity compliance by developing, managing and installing software updates on fielded MHUs and the C2 container. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor increase in FY 2020 for continued MHU support.					
Title: MCM USV Product Development	10.197	15.039	19.184	0.000	19.184
Articles:	-	-	-	-	-
FY 2019 Plans: - Complete initial design and software development efforts for craft and payload integration, command and control, and operations. - Continue system level testing. - Prepare to conduct User Operational Evaluation System (UOES) Employment. - Prepare and support design changes for initial Developmental Testing (DT). - Conduct efforts in preparation for start of MCM USV Full Rate Production (FRP) in FY 2020. - Conduct technical feasibility studies, trade study analysis, tactics development, requirements definition and USV impact studies for Mine Neutralization (Barracuda) integration with MCM USV. - Begin contractor integration testing of MCM USV w/ AQS-24B and MCM USV w/ AQS-20C. - Construct Architecture Framework products, industry requests for information and develop procurement strategy for Mine Neutralization launcher. ***FY 2020 Base Plans:*** - Complete integration of an AQS-20C and AQS-24B with the MCM USV. - Demonstrate system capability from LCS and/or shore operations through Integration Testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Finalize technical data packages for MCM USV and sonar deploy and retrieve systems. - Conduct MCM USV + MH DT and UOES. - Continue integration testing with sonar payloads. - Continue ECP development for EDM and LRIP units. - Conduct systems engineering efforts in support of program and test efforts. - Achieve Ready for Training (RFT) status. - Continue tactics development, requirements definition and design of Mine Neutralization (Barracuda) payload and integration with MCM USV. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase from FY 2019 to FY 2020 due to the MCM USV Development Tests efforts and UOES.					
Title: MCM USV Support	1.960	4.100	5.532	0.000	5.532
Articles:	-	-	-	-	-
FY 2019 Plans: - Continue program management, engineering and technical support for payload integration and testing efforts. - Support testing and User Operational Evaluation System (UOES) efforts for the assessment of system capabilities to determine Military utility. - Support FRP preparations. - Continue to update MCM USV logistics documentation and implement changes required to support UOES Employment and MCM Mission Package (MP) IOT&E. - Determine initial spares required for upcoming DT/UOES test events. - Support development of MCM USV CDD requirements. ***FY 2020 Base Plans:*** - Support testing and assessment of system capabilities to determine Military utility. - Continue efforts for FRP preparations and award. - Continue to update MCM USV documentation to include Mine Neutralization. - Procure initial spares for test events. - Continue engineering, management and logistics support to achieve FRP decisions in FY 2020.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Continue to support MCM MP integration and testing. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase from FY 2019 to FY 2020 due to commencement of UOES, DT, Full Rate Production decision, and the start of MCM MP test efforts.					
Title: MCM USV Test and Evaluation	0.000	4.350	5.500	0.000	5.500
Articles:	-	-	-	-	-
FY 2019 Plans: - Prepare for system integration and test events to include a UOES test period (for AQS-20C and AQS-24B) and a DT period for the MCM USV w/ AQS-20C sonar in preparation for future MCM MP IOT&E and production decisions. ***FY 2020 Base Plans:*** - Complete contractor integration testing of MCM USV w/ AQS-24B and MCM USV w/ AQS-20C. - Conduct UOES testing with AQS-20C and AQS-24B. - Execute MCM USV DT with AQS-20C. - Commence MCM MP DT support. - Conduct UISS test and evaluation efforts associated with ECP incorporation. - Commence support of MCM MP DT efforts. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase from FY 2019 to FY 2020 due to commencement of UOES, DT and Full Rate Production decision.					
Title: MCM USV Management Services	0.250	0.250	0.390	0.000	0.390
Articles:	-	-	-	-	-
FY 2019 Plans: - Provide program planning, management and acquisition document updates for the MCM USV program. - Begin FRP RFP development.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Release RFP and begin proposal evaluations. ***FY 2020 Base Plans:*** - Provide program planning, management and acquisition document updates for the MCM USV program. - Conduct FRP proposal evaluation and manage award of FRP contracts. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased from FY 2019 to FY 2020 due to a Full Rate Production decision and the start of MCM MP test efforts.					
Accomplishments/Planned Programs Subtotals	14.989	28.645	31.519	0.000	31.519

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 0603596N: *LCS Mission Modules*	3.900	5.000	1.800	-	1.800	0.000	0.000	0.000	0.000	0.000	64.129
• OPN/1601: *LCS MCM Mission Modules*	45.146	98.901	197.129	-	197.129	222.831	222.523	233.151	243.503	1,185.034	2,627.323
• RDTE/0603502N/9999: *Congressional Add*	12.546	60.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	72.646
• OPN/2622: *Minesweeping System Replacement*	57.343	32.367	19.448	-	19.448	15.858	16.281	16.753	17.087	Continuing	Continuing

Remarks

RDT&E/0603596N - Funding shown only reflects funding for required USV development efforts.

RDT&E/0603502N/9999 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.

OPN/1601 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.

OPN/2622 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

D. Acquisition Strategy

UISS - Requirements are documented in the Unmanned Influence Sweep System (UISS) Capability Production Document (CPD). An Engineering and Manufacturing Development (E&MD) contract was awarded in FY 2014 with options for Low Rate Initial Production (LRIP) in FY 2019. In FY 2019, MCM USV is developing a CDD leveraging existing requirements (UISS, AN/AQS-20, MCM MP, etc.). In FY 2020, MCM USV anticipates a Full Rate Production (FRP) decision and will conduct a full and open competition for FRP contract(s).

E. Performance Metrics

UISS - Successfully reach Milestone C (MS C) in FY 2019. Award LRIP options in FY 2019.
MCM USV - Achieve FRP Decision in FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Product Development	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	29.893	2.294	Jan 2018	1.000	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Product Development	SS/CPFF	JHU APL : Laurel, MD	12.215	0.000		0.000		0.000		-		0.000	0.000	12.215	-
MHU: Product Development	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	7.545	0.000		0.000		0.000		-		0.000	0.000	7.545	-
MHU: Product Development	WR	NSWC PC : Panama City, FL	0.922	0.000		0.000		0.000		-		0.000	0.000	0.922	-
MHU: Product Development	WR	NUWC N : Newport, RI	0.740	0.000		0.000		0.000		-		0.000	0.000	0.740	-
MHU: Product Development	WR	NSWC CD : Bethesda, MD	0.235	0.000		0.000		0.000		-		0.000	0.000	0.235	-
MHU: Product Development	WR	Various : Various	0.570	0.000		0.000		0.000		-		0.000	0.000	0.570	-
MCM USV: Product Development 1	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.000		0.000		2.084	Jan 2020	-		2.084	0.000	2.084	-
MCM USV: Product Development 2	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	9.040	3.180	Jan 2018	3.339	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development1	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.000		3.100	Jan 2019	9.000	Nov 2019	-		9.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	Raytheon : Portsmouth, RI	3.185	7.017	Feb 2018	1.975	Feb 2019	2.000	Nov 2019	-		2.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	JHU APL : Laurel, MD	0.000	0.000		0.750	Feb 2019	2.000	Feb 2020	-		2.000	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC PC : Panama City, FL	0.925	0.000		2.850	Jan 2019	3.000	Nov 2019	-		3.000	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NUWC N : Newport, RI	0.770	0.000		0.725	Jan 2019	0.500	Nov 2019	-		0.500	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC CD : Bethesda, MD	0.980	0.000		2.300	Jan 2019	0.600	Nov 2019	-		0.600	Continuing	Continuing	Continuing
		Subtotal	67.020	12.491		16.039		19.184		-		19.184	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Engineering Support	WR	NUWC N : Newport, RI	0.600	0.000		0.250	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC PC : Panama City, FL	2.089	0.000		0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC CD : Bethesda, MD	1.811	0.000		0.100	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.170	0.000		0.100	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.490	0.000		0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.751	0.000		0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.928	0.000		0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	SSC PAC : San Diego, CA	0.310	0.028	Dec 2017	0.030	Dec 2018	0.036	Dec 2019	-		0.036	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NSWC PC : Panama City, FL	0.817	0.116	Feb 2018	0.840	Feb 2019	0.841	Feb 2020	-		0.841	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NUWC N : Newport, RI	0.737	0.116	Mar 2018	0.000		0.000		-		0.000	0.000	0.853	-
MHU: Engineering Support	WR	NSWC CD : Bethesda, MD	0.250	0.028	Dec 2017	0.030	Dec 2018	0.036	Dec 2019	-		0.036	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	Various : Various	0.520	0.000		0.000		0.000		-		0.000	0.000	0.520	-
MCM USV: Engineering Support	WR	NSWC PC : Panama City, FL	2.458	1.370	Jan 2018	1.400	Jan 2019	1.750	Nov 2019	-		1.750	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NUWC N : Newport, RI	1.830	0.290	Jan 2018	0.800	Jan 2019	0.750	Nov 2019	-		0.750	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NSWC CD : Bethesda, MD	0.000	0.300	Jan 2018	0.000		0.400	Dec 2019	-		0.400	0.000	0.700	-
MCM USV: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.000		0.215	Jan 2019	1.000	Nov 2019	-		1.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 1234 / *Unmanned Surface Vehicle (USV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.000	0.000		0.000		0.062	Dec 2019	-		0.062	0.000	0.062	-
MCM USV: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.000		0.061	Dec 2019	-		0.061	0.000	0.061	-
MCM USV: Integrated Logistics	SS/CPFF	Raytheon : Portsmouth, RI	0.000	0.000		0.400	Jan 2019	0.400	Dec 2019	-		0.400	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	SS/CPFF	Northrup Grumman : Annapolis, MD	0.000	0.000		0.300	Mar 2019	0.300	Mar 2020	-		0.300	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.000		0.985	Feb 2019	0.809	Feb 2020	-		0.809	Continuing	Continuing	Continuing
		Subtotal	14.761	2.248		6.250		6.445		-		6.445	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Test and Evaluation	WR	NSWC PC : Panama City, FL	1.030	0.000		1.050	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Test and Evaluation	WR	NSWC CD : Bethesda, MD	1.331	0.000		0.400	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Test and Evaluation	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	1.709	0.000		0.175	Dec 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Test and Evaluation	WR	NSWC PC : Panama City, FL	0.000	0.000		2.200	Mar 2019	2.500	Dec 2019	-		2.500	Continuing	Continuing	Continuing
MCM USV: Test and Evaluation	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.250	Mar 2019	1.500	Dec 2019	-		1.500	Continuing	Continuing	Continuing
MCM USV: Test and Evaluation	SS/CPFF	Raytheon : Portsmouth, RI	0.000	0.000		0.400	Mar 2019	0.500	Dec 2019	-		0.500	Continuing	Continuing	Continuing
MCM USV: Test and Evaluation	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	0.000	0.000		1.500	Mar 2019	1.000	Dec 2019	-		1.000	0.000	2.500	-
		Subtotal	4.070	0.000		5.975		5.500		-		5.500	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

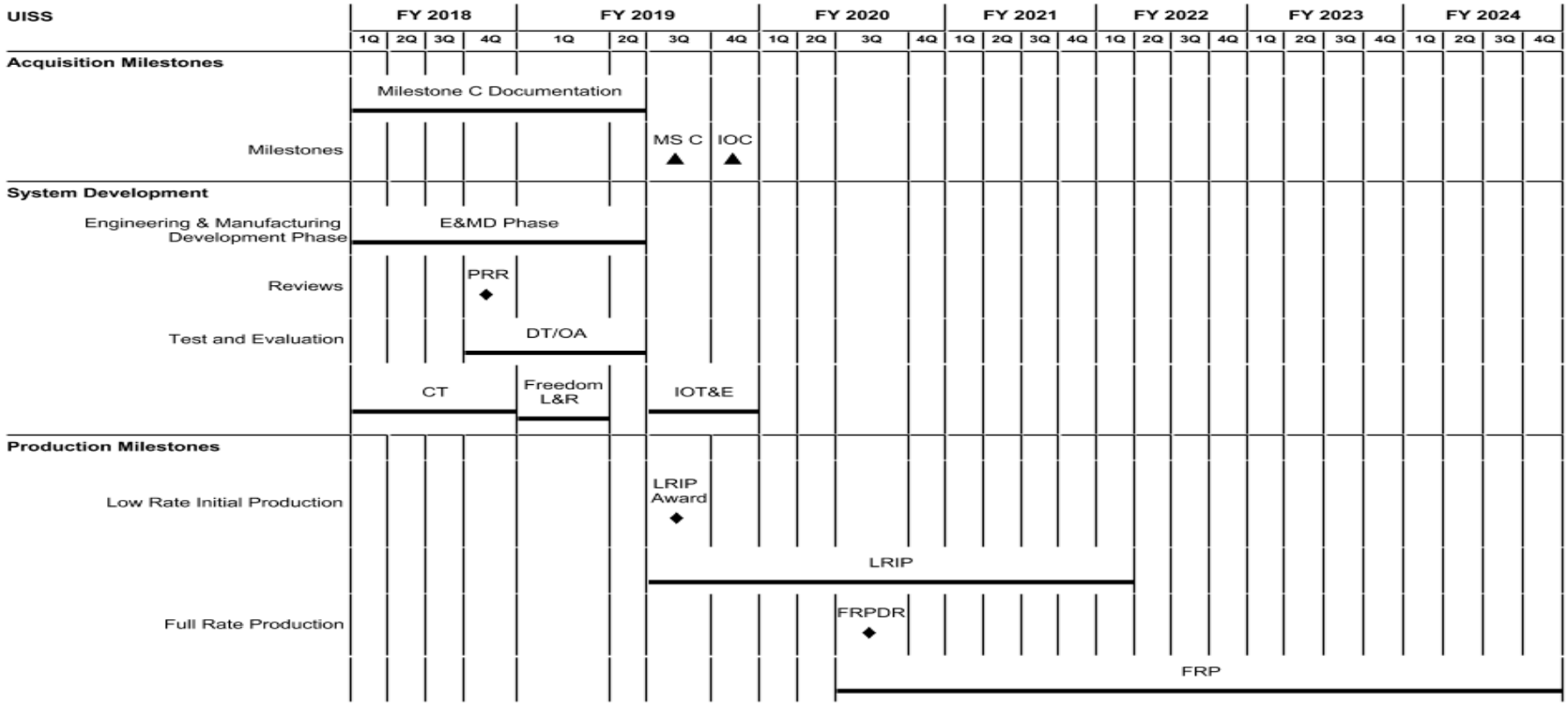
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Travel	WR	NAVSEA : Washington, DC	0.275	0.000		0.020	Jan 2019	0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Management	C/CPAF	TBD : TBD	2.164	0.000		0.111	Nov 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Travel	WR	NAVSEA : Washington, DC	0.000	0.100	Jan 2018	0.100	Jan 2019	0.120	Jan 2020	-		0.120	Continuing	Continuing	Continuing
MCM USV: Management	C/CPAF	TBD : TBD	0.000	0.150	Nov 2017	0.150	Nov 2018	0.270	Nov 2019	-		0.270	Continuing	Continuing	Continuing
		Subtotal	2.439	0.250		0.381		0.390		-		0.390	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	88.290	14.989		28.645		31.519		-		31.519	Continuing	Continuing	N/A

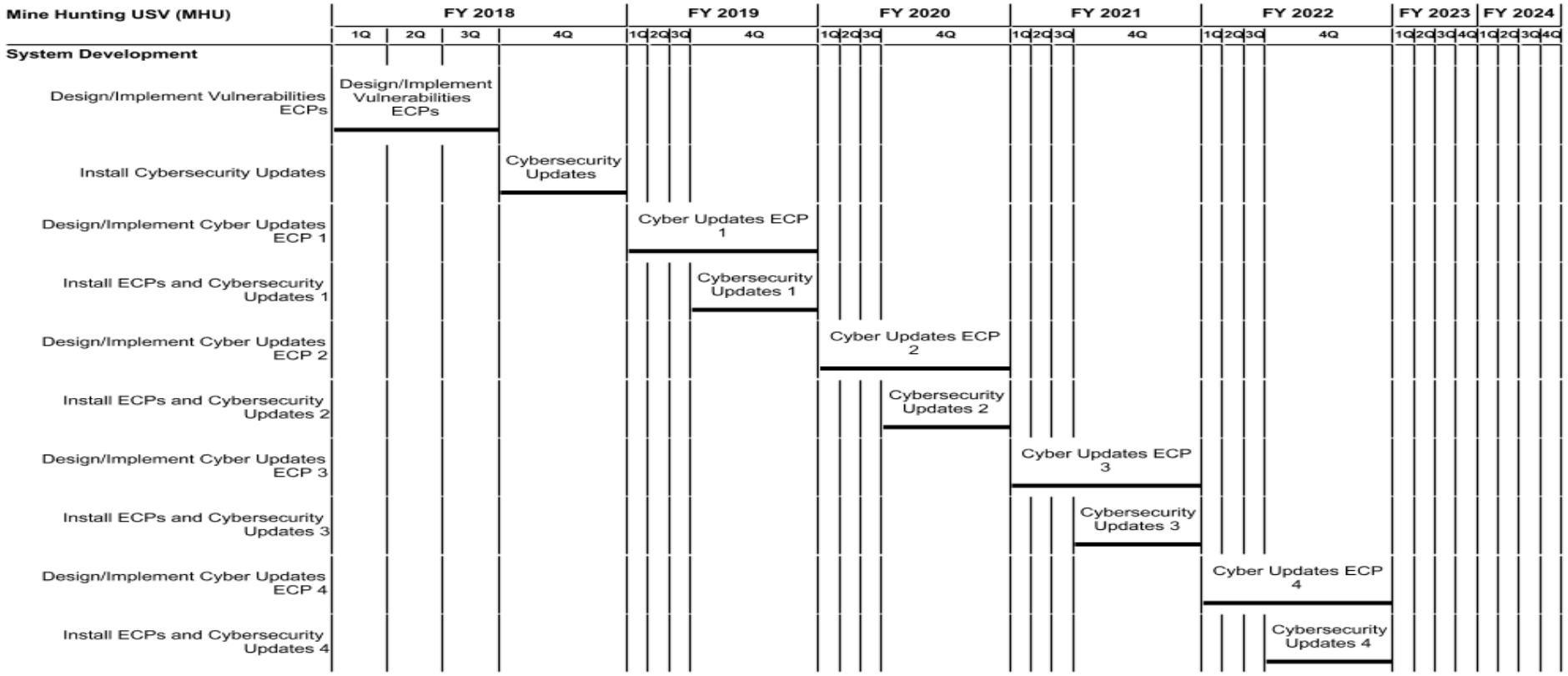
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*



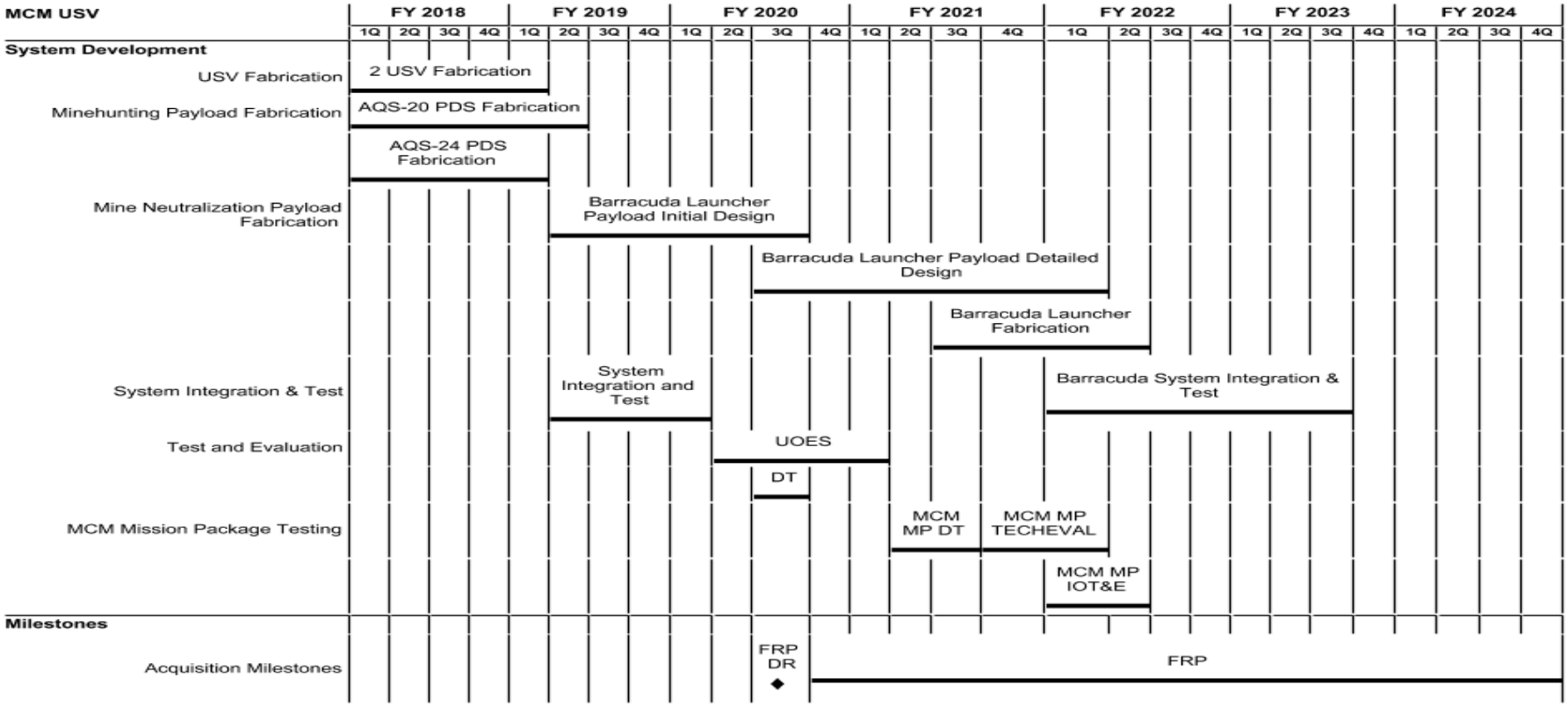
2020PB - 0603502N - 1234

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*



2020PB - 0603502N - 1234

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*



2020PB - 0603502N - 1234

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UISS				
Acquisition Milestones: Milestone C Documentation	1	2018	2	2019
Acquisition Milestones: Milestones: Milestone C	3	2019	3	2019
Acquisition Milestones: Milestones: Initial Operational Capability	4	2019	4	2019
System Development: Engineering & Manufacturing Development Phase: Engineering & Manufacturing Development Phase	1	2018	2	2019
System Development: Reviews: Production Readiness Review (PRR)	4	2018	4	2018
System Development: Test and Evaluation: DT Testing	4	2018	2	2019
System Development: Test and Evaluation: LCS L&R	1	2019	1	2019
System Development: Test and Evaluation: Initial Operational Test & Evaluation	3	2019	4	2019
System Development: Test and Evaluation: Contractor Testing	1	2018	4	2018
Production Milestones: Low Rate Initial Production: LRIP Contract Award	3	2019	3	2019
Production Milestones: Low Rate Initial Production: LRIP phase	3	2019	1	2022
Production Milestones: Full Rate Production: Full Rate Production Decision Review	3	2020	3	2020
Production Milestones: Full Rate Production: Full Rate Production	3	2020	4	2024
Mine Hunting USV (MHU)				
System Development: Design/Implement Vulnerabilities ECPs: Design/Implement Vulnerabilities ECPs	1	2018	3	2018
System Development: Install Cybersecurity Updates: Install Cybersecurity Updates	4	2018	4	2018
System Development: Design/Implement Cyber Updates ECP 1: Design/Implement Cyber Updates ECP 1	1	2019	4	2019
System Development: Install ECPs and Cybersecurity Updates 1: Install ECPs and Cybersecurity Updates 1	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Design/Implement Cyber Updates ECP 2: Design/Implement Cyber Updates ECP 2	1	2020	4	2020
System Development: Install ECPs and Cybersecurity Updates 2: Install ECPs and Cybersecurity Updates 2	4	2020	4	2020
System Development: Design/Implement Cyber Updates ECP 3: Design/Implement Cyber Updates ECP 3	1	2021	4	2021
System Development: Install ECPs and Cybersecurity Updates 3: Install ECPs and Cybersecurity Updates 3	4	2021	4	2021
System Development: Design/Implement Cyber Updates ECP 4: Design/Implement Cyber Updates ECP 4	1	2022	4	2022
System Development: Install ECPs and Cybersecurity Updates 4: Install ECPs and Cybersecurity Updates 4	4	2022	4	2022
MCM USV				
System Development: USV Fabrication: 2 USV Fabrication	1	2018	1	2019
System Development: Minehunting Payload Fabrication: AQS-20 PDS Fabrication	1	2018	2	2019
System Development: Minehunting Payload Fabrication: AQS-24 PDS Fabrication	1	2018	1	2019
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher Payload Initial Design	2	2019	3	2020
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher Payload Detailed Design	3	2020	1	2022
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher Fabrication	3	2021	2	2022
System Development: System Integration & Test: System Integration and Test	2	2019	1	2020
System Development: System Integration & Test: Barracuda System Integration & Test	1	2022	3	2023
System Development: Test and Evaluation: UOES	2	2020	1	2021
System Development: Test and Evaluation: Development Test	3	2020	3	2020
System Development: MCM Mission Package Testing: Developmental Testing	2	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 1234 / *Unmanned Surface Vehicle (USV)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: MCM Mission Package Testing: Tech Eval	4	2021	1	2022
System Development: MCM Mission Package Testing: IOT&E	1	2022	2	2022
Milestones: Acquisition Milestones: Full Rate Production Decision Review	3	2020	3	2020
Milestones: Acquisition Milestones: Full Rate Production	4	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2989 / *Barracuda*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
2989: *Barracuda*	0.000	20.572	28.803	28.641	-	28.641	33.205	38.387	37.869	38.631	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY 2020 funding request was reduced by $3.300M to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Barracuda program provides an expendable, low cost, and unmanned mine neutralization capability against previously located near-surface mines with the potential to address other targets. Barracuda is a mine neutralization system with the form factor of an A-size sonobuoy. It is a modular weapon that will be stored and assembled on LCS, will be deployed from the Mine Countermeasures Unmanned Surface Vehicle (MCM USV), and will maintain communications with the operator on LCS while autonomously re-acquiring mines in the near surface and await a fire command from the operator on board LCS.

An Analysis of Alternatives (AoA) for near surface mine neutralization requirements was conducted in June 2015 and Barracuda was selected. The Barracuda Capabilities Development Document (CDD) was approved on September 2016. The Barracuda program achieved Milestone B on 12 April 2018.

The Department awarded a cost-plus incentive contract for the Barracuda detail design, development, test, and qualification to Raytheon (Integrated Defense Systems, Portsmouth, RI) on April 17, 2018, with an awarded value of $84.8 million. The maximum contract value for Barracuda detailed design and development to include all EDMs, LRIP units, and support equipment is $364.3 million, with a period of performance through November 2022. The program has conducted system functional and requirements reviews in November 2018 and a preliminary design review in March 2019. A critical design review is scheduled for March 2020, which precedes the start of qualification and performance testing.

Barracuda provides the only near surface mine neutralization system that will allow the Littoral Combat Ship (LCS) Mine Countermeasure (MCM) Mission Package (MP) to fully meet its two mine hunting performance requirements. Initial Barracuda deployment will be on the MCM USV as part of the LCS MCM MP.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Barracuda: Product Development	16.118	23.828	23.785	0.000	23.785
Articles:	-	-	-	-	-
FY 2019 Plans: Complete System Requirements and Functional Review (SRR & SFR). Begin component modeling, simulation, fabrication and testing to verify design at Preliminary Design Review (PDR) in 2QFY19. Following PDR, the program will commence detailed system design and preparations for Critical Design Review in 2QFY20. Conduct and manage safety reviews as design matures.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Conduct Barracuda Critical Design Review (CDR) and conduct contractor led initial system qualification and performance demonstration. Complete CDR Safety Reviews in advance of EDM procurement. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020.					
Title: Barracuda: Engineering Support	4.168	4.758	4.621	0.000	4.621
Articles:	-	-	-	-	-
FY 2019 Plans: Evaluate and manage contractor deliverables, overseeing system engineering design effort. ***FY 2020 Base Plans:*** Complete CDR. Continue to evaluate and manage contractor deliverables and contractor detailed design effort in preparation for EDM purchase and developmental testing. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change from FY 2019 to FY 2020.					
Title: Barracuda: Management Services	0.286	0.217	0.235	0.000	0.235
Articles:	-	-	-	-	-
FY 2019 Plans: Continue to provide program management, financial management and engineering support. ***FY 2020 Base Plans:*** Continue to provide program management, financial management and engineering support. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No significant change from FY 2019 to FY 2020.					
Accomplishments/Planned Programs Subtotals	20.572	28.803	28.641	0.000	28.641

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Transition ONR FNC SS DTE to Barracuda in FY17 and FY18 to reduce design risk for a low cost modular neutralizer that leverages economies of scale and reduces total ownership cost. Barracuda RFP was released in 3QFY17. Milestone B was accomplished in 3QFY18. Cost plus incentive fee base contract (awarded April 2018) to design and deliver 750 Engineering Development Models (EDMs) with two cost plus fixed fee Low Rate Initial Production (LRIP) options to manufacture and deliver 1000 Barracudas per option. Base award will occur in 3QFY18. The government will manage a production cost model throughout the detailed design effort to deliver a low cost design in the Technical Data Package (TDP). There will be Government Purpose Rights on the TDP that will enable release of the TDP for a full and open competition of the Full Rate Production (FRP) contract planned in FY25. Initial Operating Capability (IOC) planned for 4QFY24.

E. Performance Metrics

Efficient design, fabrication, and testing to deliver a low cost solution that achieves required probability of kill against near surface mines.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2989 / *Barracuda*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Hardware/ Support	C/CPIF	Raytheon (Integrated Defense Systems) : Portsmouth, RI	0.000	16.118	Apr 2018	23.828	Jan 2019	23.785	Jan 2020	-		23.785	0.000	63.731	92.000
		Subtotal	0.000	16.118		23.828		23.785		-		23.785	0.000	63.731	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Engineering Support	WR	NUWC NPT : Newport, RI	0.000	0.544	Dec 2017	0.449	Dec 2018	0.569	Dec 2019	-		0.569	Continuing	Continuing	Continuing
Barracuda Engineering Services	C/CPIF	JHU APL : Baltimore, MD	0.000	0.598	Dec 2017	0.710	Dec 2018	0.801	Dec 2019	-		0.801	Continuing	Continuing	Continuing
Barracuda Engineering Support	WR	NSWC, PC : Panama City, FL	0.000	1.322	Dec 2017	1.352	Dec 2018	1.400	Dec 2019	-		1.400	Continuing	Continuing	Continuing
Barracuda Support	WR	NSWC, IHD : Indian Head, MD	0.000	1.257	Dec 2017	1.359	Dec 2018	1.275	Dec 2019	-		1.275	0.000	3.891	-
Barracuda Support	WR	Naval Research Lab : Washington, DC	0.000	0.193	Dec 2017	0.578	Dec 2018	0.302	Dec 2019	-		0.302	0.000	1.073	-
Barracuda Support	WR	NSWC, Carderock : Bethesda, MD	0.000	0.254	Dec 2017	0.310	Dec 2018	0.274	Dec 2019	-		0.274	0.000	0.838	-
		Subtotal	0.000	4.168		4.758		4.621		-		4.621	Continuing	Continuing	N/A

Management Services ($ in Millions)

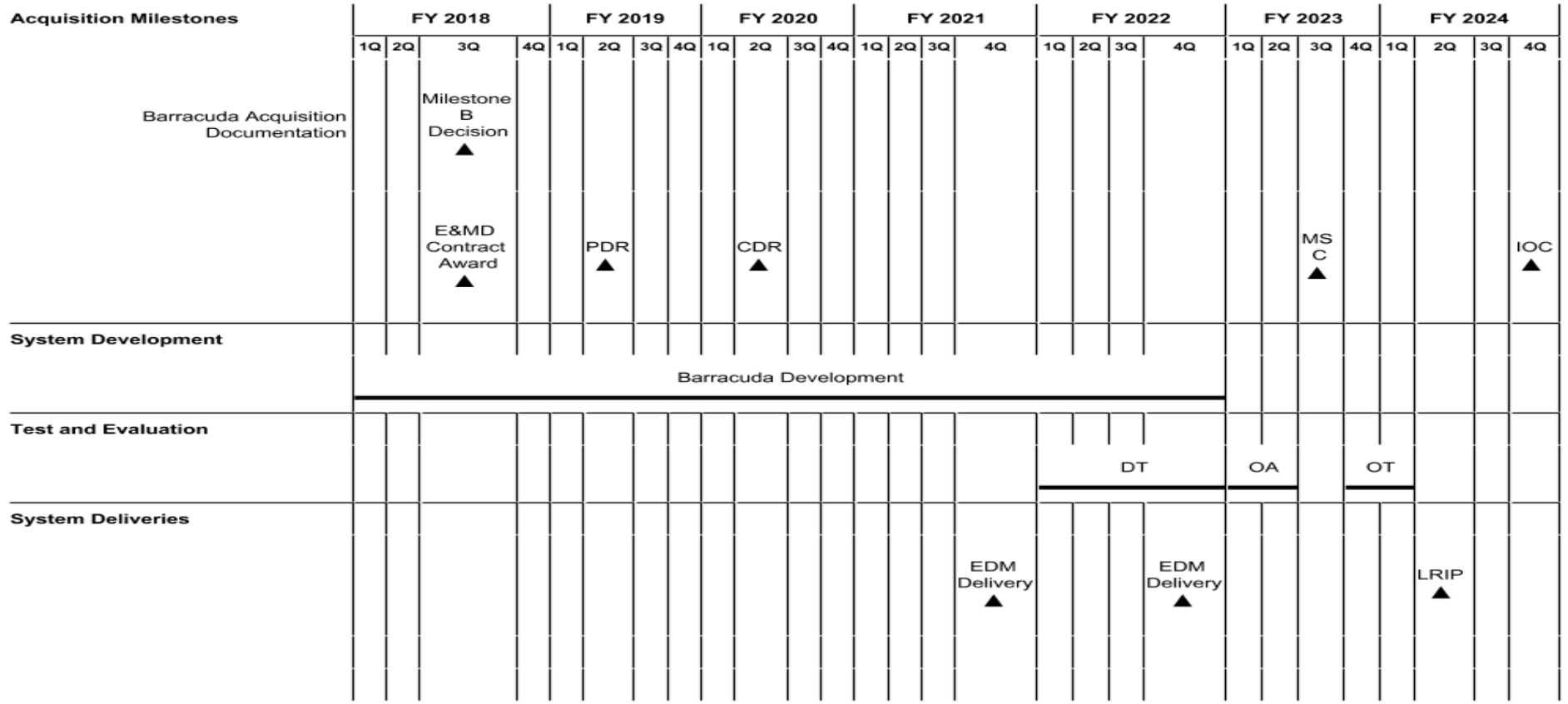
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Management Support	WR	NSWC, PC : Panama City, FL	0.000	0.286	Dec 2017	0.217	Dec 2018	0.235	Dec 2019	-		0.235	0.000	0.738	-
		Subtotal	0.000	0.286		0.217		0.235		-		0.235	0.000	0.738	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 2989 / *Barracuda*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	20.572		28.803		28.641		-		28.641	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*



2020PB - 0603502N - 2989

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 2989 / *Barracuda*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones				
Barracuda Acquisition Documentation: Milestone B	3	2018	3	2018
Barracuda Acquisition Documentation: Contract Award	3	2018	3	2018
Barracuda Acquisition Documentation: Prelimindary Design Review	2	2019	2	2019
Barracuda Acquisition Documentation: Critical Design Review	2	2020	2	2020
Barracuda Acquisition Documentation: Milestone C	3	2023	3	2023
Barracuda Acquisition Documentation: Initial Operational Capability	4	2024	4	2024
System Development: Barracuda Development	1	2018	4	2022
Test and Evaluation: Development Testing	1	2022	4	2022
Test and Evaluation: Operational Assessment	1	2023	2	2023
Test and Evaluation: Operational Test	4	2023	1	2024
System Deliveries: Incremental Engineering Development Model Deliveries 1	4	2021	4	2021
System Deliveries: Incremental Engineering Development Model Deliveries 2	4	2022	4	2022
System Deliveries: Incremental Low Rate Initial Production Deliveries	2	2024	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3066 / *Large Unmanned Surface Vehicle (LUSV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3066: *Large Unmanned Surface Vehicle (LUSV)*	0.000	0.000	0.000	372.527	-	372.527	535.364	584.323	607.616	637.984	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The Large Unmanned Surface Vehicle (LUSV) project leverages efforts under PE 0604250D8Z through the Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO) Ghost Fleet - Overlord project. This project is a new start for the Navy in FY2020

A. Mission Description and Budget Item Justification

As part of the Unmanned Surface Vehicle (USV) Family of Systems (FoS), the Large USV (LUSV) project provides resources for the detailed design, fabrication, testing and support of the LUSV. LUSV is defined as having a reconfigurable, multi-mission capability which is accomplished via an organic warfare capability and may be augmented with additional modular payloads. The LUSV organic warfare capability will be procured under the Unmanned Surface Vessel Enabling Capabilities project unit and is intended to utilize existing payloads including Navy launchers and sensors. Modular payloads may be developed separately by other programs or prototyping efforts and will be further developed and/or integrated into LUSV under the Enabling Capabilities project unit that supports MUSV and LUSV. LUSVs are assumed to be greater than 50m in length in order to deliver the organic payload capability and endurance required. LUSVs will be based on commercial designs with organic capability added to provide additional Anti-Surface Warfare (ASuW) and Strike capacity to the surface fleet. LUSVs will provide relatively low cost, high endurance, reconfigurable ships able to accommodate various payloads for unmanned missions to augment the Navy's manned surface force.

LUSVs will be long endurance vessels with large payload capacity, designed to conduct a variety of warfare operations independently or in conjunction with manned surface combatants. LUSVs will be capable of semi-autonomous or fully autonomous operation, with operators in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via the afloat element (i.e., embarked on a United States Navy (USN) combatant/support ship), or via the ashore element (C2 station ashore). LUSV C2, combat and/or weapon system integration will employ tamper proofing and security controls to prevent disclosure of data and electronic warfare defenses during autonomous operation. LUSVs will employ a Risk Management Framework (RMF) approach with physical, technical and administrative security controls. LUSVs will have hardware and software components to protect classified/sensitive functions, countermeasures designed to thwart adversary exploitation, classified data sanitation requirements, anti-tamper mechanisms to prevent disclosure of data and autonomous zeroization, and electronic warfare defenses. LUSVs will be capable of weeks-long deployments and trans-oceanic transits and operate aggregated with Carrier Strike Groups (CSGs) and Surface Action Groups (SAGs), as well as have the ability to deploy independently.

LUSV will leverage efforts external to this project unit accomplished through the Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO) Ghost Fleet - Overlord project investments in FY 2018 (continuing through FY 2021). Overlord converts existing commercial fast supply vessels into experimentation LUSVs, with the end goal to demonstrate relevant Navy Surface Warfare missions utilizing modular prototype payloads. The Overlord systems will also advance the technology needed for autonomous operation of pier-launched vessels as well as increase the reliability and redundancy required to support an unmanned Hull, Mechanical, and Electrical (HM&E) system. The Overlord systems will be able to travel thousands of miles between port visits, as well as operate for weeks at a time. The Overlord

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*

program will procure 2 experimentation LUSVs (based on existing fast supply vessels) in FY 2019 and will develop fleet-ready C2 elements that will be directly incorporated into MUSV and LUSV.

The Navy is able to rapidly initiate the LUSV program in FY 2020 as a direct result of transitioning the OSD SCO Ghost Fleet Overlord technology. In addition to the two experimentation LUSVs procured in FY 2019 by the Ghost Fleet Program, the Navy will procure two FY 2020 experimentation LUSVs of the same configuration (from the same vendors on the same contracts) as the Ghost Fleet Overlord systems and modular payloads will be procured to fully populate the 4 Overlord (2 SCO funded in FY 2019 and 2 Navy funded in FY 2020) experimentation LUSVs. While the Overlord configuration rapidly delivers an initial LUSV capability, it does not provide the integrated and organic capability or capacity intended for the LUSV program. The Navy intends to begin procuring LUSVs at a rate of 2 per year starting in FY 2021. Design contracts will be competitively awarded in FY 2020 to develop an LUSV with an integrated (GFE) launcher system and capacity for additional modular payloads. LUSVs of this configuration will be procured starting in FY 2021 with competitive detail design and construction contract(s). Payloads will be procured separately.

Future missions for LUSV will be informed by the Navy's Future Surface Combatant Force (FSCF) Analysis of Alternatives (AoA) and as future payloads and concept of operations (CONOPs) are developed. LUSV is a key enabler of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy (alone or in teams/swarms), team with individual manned combatants or augment battle groups with an LUSV distributed Anti-Surface Warfare (ASuW) and Strike capacity. Fielding of LUSV will provide the Navy increased capability and necessary capacity at lower projected procurement and sustainment costs, reduced risk to sailors and increased readiness by offloading missions from manned combatants.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	0.000	0.000	346.002	0.000	346.002
Articles:	-	-	-	-	-
FY 2019 Plans: N/A					
FY 2020 Base Plans: In order to reduce risk and ensure technology reaches the required maturity level to support LUSV plans in FY 2021, the Navy plans to procure quantity two (2) additional Overlord configuration experimentation LUSVs via the existing Ghost Fleet - Overlord contract vehicle established under PE 0604250D8Z through the Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO) in FY 2020. These vessels are based on commercial designs. The Navy will procure and provide GFE in the form of communications gear, USV Command and Control (C2) software, and prototype modular payloads (also developed by separate OSD SCO programs). While these systems will be deployable assets, the Navy plans to place these units in a Surface Development Squadron to ensure Tactics, Techniques and Procedures are developed to allow the fleet to operate and fight alongside manned systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
LUSVs will need to be developed and constructed to meet the capabilities required by the Navy. There is no platform that exists that meets all Navy payload capabilities within the necessary operational envelope. The Navy will execute a design contract in FY 2020 to convert existing commercial vessels to operate unmanned while meeting the payload capacity to fulfill ASuW requirements. The OSD SCO Overlord program will influence the requirements and specifications for the Navy's desired LUSV. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding supports the award of two (2) experimentation LUSVs and procurement of modular payloads.					
Title: Support ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Award design contract(s) to convert existing commercial platforms to LUSVs capable of meeting Top Level Requirements (TLR). The LUSV design will be driven by a government-produced performance specification and enforce the principles of open architecture through interface control documents for all major subsystems. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 support funding supports the procurement of two (2) experimentation LUSVs and procurement of modular payloads.	0.000 -	0.000 -	24.525 -	0.000 -	24.525 -
Title: Management Services ***Articles:*** ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** Develop all governing documentation as required to support advancement of the LUSV program. This includes the creation of the following artifacts: System Engineering Plan (SEP), Test and Evaluation Strategy (TES),	0.000 -	0.000 -	2.000 -	0.000 -	2.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Life Cycle Support Plan (LCSP), Cybersecurity Strategy, Open Systems Architecture Management Plan, Corrosion Prevention and Control Plan, Weight Control Plan, Quality Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan and Program Protection Plan (PPP). ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding supports the management of contract award of two (2) experimentation LUSVs and procurement of modular payloads.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	372.527	0.000	372.527

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

To mitigate technical risk, two Overlord configuration experimentation LUSVs will be procured in FY 2020 using the existing OSD SCO Overlord contracts. LUSV will pursue authority for FY 2020 contract awards under the U.S. Code, Title X, Statute 2358 for Research and Development Projects. Navy required capabilities will be captured in a Top Level Requirements (TLR) document approved by the OPNAV Director of Surface Warfare. A full and open Concept Design RFP will be released to industry in FY 2019 (Note: Congressional Add of $42.000M in Project Unit 9999/C442) with a plan to award multiple Concept Design contracts in FY 2020. Concept Design(s) delivered in FY 2020/2021 will inform the Navy's full and open Detailed Design and Construction (DD&C) RFP, which will be released to industry in FY 2020. In FY 2021 a DD&C contract for initial LUSVs will be awarded to one or more vendors. Two LUSVs will be procured annually starting in FY 2021 and continuing to FY 2024. The Navy is evaluating the ideal transition point to an ACAT program with procurement (SCN) funding.

E. Performance Metrics

Award of Overlord configuration experimentation LUSV options in FY 2020.
Award of LUSV Concept Design contract(s) in FY 2020.
Award of LUSV DD&C contract(s) in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3066 / *Large Unmanned Surface Vehicle (LUSV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design Support	C/CPIF	TBD : TBD	0.000	0.000		0.000		70.000	Jan 2020	-		70.000	Continuing	Continuing	Continuing
Fabrication & System/ Payload Integration	C/CPIF	TBD : TBD	0.000	0.000		0.000		180.040	Jan 2020	-		180.040	Continuing	Continuing	Continuing
GFE/Long Lead Time Material	C/FFP	TBD : TBD	0.000	0.000		0.000		89.962	Jan 2020	-		89.962	0.000	89.962	-
LUSV Specification/ Contract Support	WR	Various : Various	0.000	0.000		0.000		6.000	Jan 2020	-		6.000	0.000	6.000	-
		Subtotal	0.000	0.000		0.000		346.002		-		346.002	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SUPSHIP, WF Center Support	WR	Various : Various	0.000	0.000		0.000		20.350	Jan 2020	-		20.350	Continuing	Continuing	Continuing
LUSV Source Selection	WR	Various : Various	0.000	0.000		0.000		4.175	Jan 2020	-		4.175	0.000	4.175	-
		Subtotal	0.000	0.000		0.000		24.525		-		24.525	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : Washington, DC	0.000	0.000		0.000		0.200	Jan 2020	-		0.200	Continuing	Continuing	Continuing
Management Services	WR	Various : Various	0.000	0.000		0.000		1.800	Jan 2020	-		1.800	0.000	1.800	-
		Subtotal	0.000	0.000		0.000		2.000		-		2.000	Continuing	Continuing	N/A

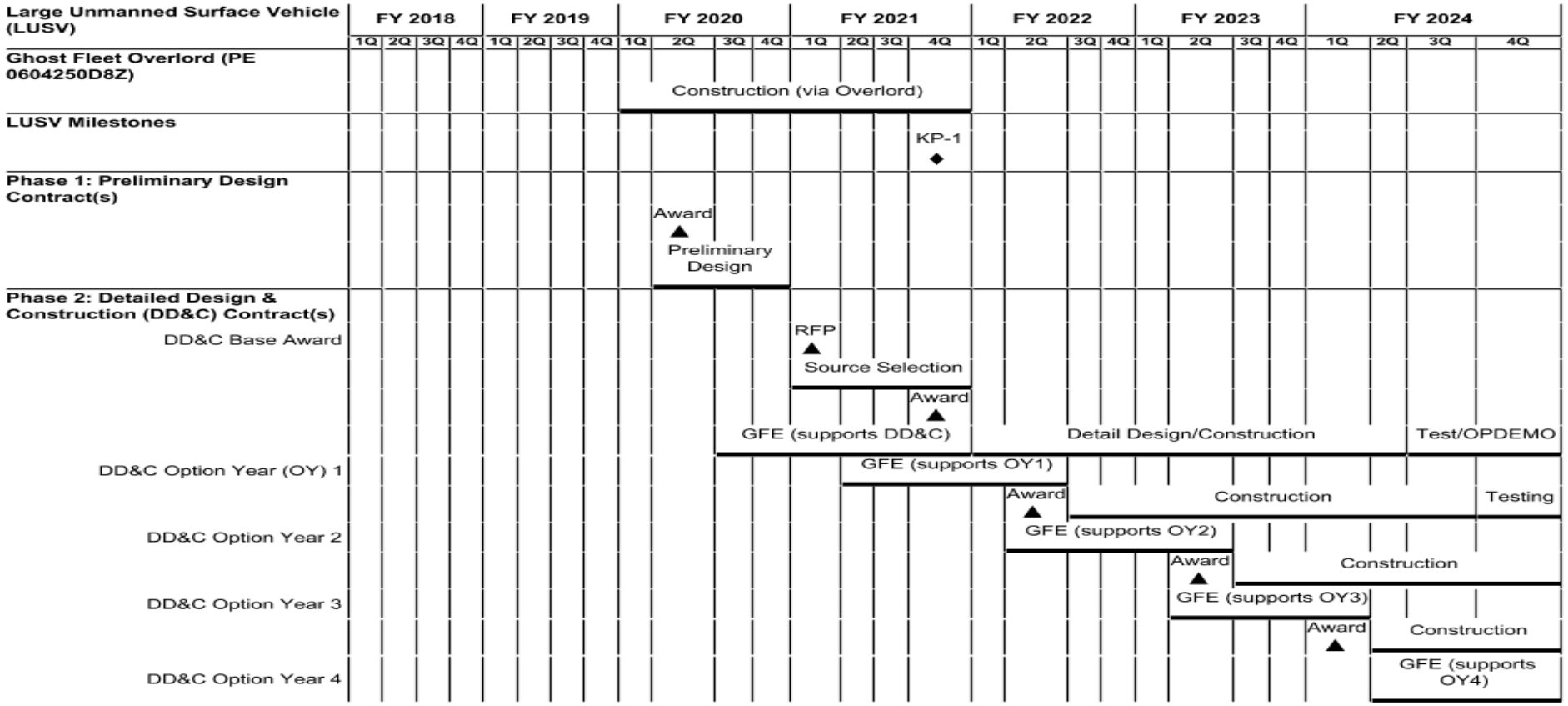
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		372.527		-		372.527	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3066 / *Large Unmanned Surface Vehicle (LUSV)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*



2020PB - 0603502N - 3066

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Large Unmanned Surface Vehicle (LUSV)				
Ghost Fleet Overlord (PE 0604250D8Z): Construction (via Overlord)	1	2020	4	2021
LUSV Milestones: Knowledge Point 1	4	2021	4	2021
Phase 1: Preliminary Design Contract(s): Preliminary Design Contract(s) Award	2	2020	2	2020
Phase 1: Preliminary Design Contract(s): Preliminary Design	2	2020	4	2020
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: RFP	1	2021	1	2021
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: Source Selection	1	2021	4	2021
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: Award	4	2021	4	2021
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: GFE LLTM in support of DD&C	3	2020	4	2021
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: Detailed Design and Construction (DD&C)	1	2022	2	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Base Award: Test/OPDEMO	3	2024	4	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year (OY) 1: GFE LLTM	2	2021	2	2022
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year (OY) 1: Option Year 1 Award	2	2022	2	2022
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year (OY) 1: Construction	3	2022	3	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year (OY) 1: Testing	4	2024	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3066 / *Large Unmanned Surface Vehicle (LUSV)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 2: GFE LLTM	2	2022	2	2023
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 2: Option Year 2 Award	2	2023	2	2023
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 2: Construction	3	2023	4	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 3: GFE LLTM	2	2023	1	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 3: Option Year 3 Award	1	2024	1	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 3: Construction	2	2024	4	2024
Phase 2: Detailed Design & Construction (DD&C) Contract(s): DD&C Option Year 4: GFE LLTM	2	2024	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3067 / *Unmanned Surface Vehicle Enabling Capabilities*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3067: *Unmanned Surface Vehicle Enabling Capabilities*	0.000	0.000	0.000	50.413	-	50.413	199.277	177.280	247.458	132.039	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start in FY2020

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 Unmanned Surface Vessel Enabling Capabilities project includes development, test, and integration of USV technologies; the advancement of Defense Advanced Research Projects Agency (DARPA), Office of Naval Research (ONR) and Industry USV efforts for associated technologies and the development and fabrication of payloads for LUSVs. USV technology efforts in this project unit support demonstration of mission level autonomy, communications, command and control, navigation compliance with the International Regulations for Preventing Collisions at Sea 1972 (COLREGS), endurance, at sea replenishment, payload feasibility, mission planning and execution for the Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO) Overlord efforts, and enabling technologies for other USVs in the USV FoS, as applicable.

Modular payloads employed by Medium Unmanned Surface Vehicles (MUSVs) and Large Unmanned Surface Vessels (LUSVs) will be developed under this project unit. Payloads will be customized to meet Navy needs and demonstrate useful capability for the Fleet. MUSVs will achieve their mission capability through their employment of modular payloads. LUSVs will augment their organic warfare capability with additional modular payloads.

Efforts for the LUSV organic warfare capability will also be developed under this project. In order to support the LUSV primary missions, investment in LUSV payload development, payload integration, and Integrated Combat System (ICS) development is required. Investment is also needed to support LUSV payload testing and follow-on operations. Due to the nature of this project, specific applications and detailed plans are available at a higher classification.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	0.000	0.000	44.613	0.000	44.613
Articles:	-	-	-	-	-
FY 2019 Plans: N/A					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Utilize Future Surface Combatant Force (FSCF) Technology Investment Strategy to transition mature products to USVs that increase capabilities to levels required to support Navy Warfighting Requirements Efforts include developing and integrating innovative payloads onto USVs to improve warfighting capabilities. Utilize FSCF payload investments developed by Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO) to support the acquisition and integration of payload capabilities, development of the Integrated Combat System (ICS) and plans for industry competition for both large and small businesses (i.e., Request for Proposal (RFP) development, SBIR Phase III). Leveraging the Naval Research and Development Enterprise and Industry, options will be assessed for the impact to warfighting capabilities. Additionally, market research and technology feasibility studies will assess options available and the impact to warfighting capabilities. FY 2020 efforts will include technical studies for Elevated Sensor technologies/modalities to provide wide defensive radar coverage and detect/track/identify objects from extended distances. Efforts will also include the development of Elevated Sensor contract(s) to design, develop, and demonstrate a persistent airborne system capable of providing USVs with more time and more battle space to identify potential threats and make critical decisions. Initial requirements derived through market research and studies will drive design efforts of prototype systems of explosive and non-lethal payloads. The payloads will be initially integrated and demonstrated on the OSD SCO Overlord efforts, and developed for integration into other applicable FoS USVs when ready. Additional tasks include Fleet experimentation with both Overlord and Sea Hunter USVs. Develop and deliver ICS that will be ready for combined and integrated capabilities, with the ICS infrastructure ready to support any future capabilities. Each subsequent increment will be back-compatible to upgrade previous increments, resulting in the first 8 LUSVs with a common and certified ICS that can be rapidly upgraded and modernized as necessary. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding represents development and integration ramp necessary to transition separate SCO prototype efforts into a single ICS infrastructure that can support LUSV payloads, for integration and testing of Payload module, increased coordination of autonomy and common control efforts and completion of prototype fabrication efforts, and operational employment of payloads through experimentation across designated missions to meet the first LUSVs and MUSVs.					
Title: Support	0.000	0.000	5.750	0.000	5.750

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Articles:	-	-	-	-	-
FY 2019 Plans: N/A ***FY 2020 Base Plans:*** In conjunction with the Office of the Chief of Naval Operations (OPNAV), update requirements documents, develop interface control specifications and architecture documentation, develop ship design and top side layout drawings and develop T&E plan for USV ICS and payloads. Update documentation and continue work on development of common autonomy standards, interfaces, and systems and support modeling/simulation efforts and prototype development. Update CCS documentation and support testing and design efforts. Sustainment, operation and maintenance of experimental MUSV and LUSV platforms. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding supports integration and testing of payload modules, increased coordination of autonomy and common control efforts, completion of prototype fabrication efforts, engineering and programmatic documentation required in support of for USV ICS and payloads, development and transition to ensure thorough Request for Proposals (RFPs), contract evaluation consistency, development sufficiency, and fielding efficiency and sustainment of experimental MUSV and LUSV platforms. This reduces program risk to capability development and fielding.					
Title: Management Services	0.000	0.000	0.050	0.000	0.050
Articles:	-	-	-	-	-
FY 2019 Plans: N/A ***FY 2020 Base Plans:*** Provide execution of the product development and support tasks. Develop acquisition documents to include Systems Engineering Plan (SEP), T&E Master Plan, integrated master schedule, risk evaluations and Independent Cost Estimates (ICE) based on the required capabilities. Oversee transition of payload prototypes and associated experimentation and risk reduction efforts. Coordinate with and across supporting					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
activities (e.g., Program Executive Office (PEO) Integrated Warfare Systems (IWS), PEO Command, Control, Communications, Computers and Intelligence (C4I)), warfare centers, labs, and industry partners to address requirements, manage funding and execute plans for the integration of LUSV payloads with the USV ICS. Oversee transition of payload prototypes and associated experimentation and risk reduction efforts. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding supports integration and testing of Payload module, increased coordination of autonomy and common control efforts, completion of prototype fabrication efforts, review and approval of engineering and programmatic documentation required in support of LUSV ICS and payloads, development and transition to ensure thorough Request for Proposals (RFPs), contract evaluation consistency, development sufficiency and fielding efficiency. This reduces program risk to capability development and fielding.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	50.413	0.000	50.413

C. Other Program Funding Summary ($ in Millions)

N/A

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). By leveraging efforts from the Naval Research and Development Enterprise and Industry for associated technologies and payloads and integrating them into USVs at the appropriate level of technical maturity, USV capabilities for the Fleet will be increasingly enhanced. Coordination with UxS platforms will eliminate redundant efforts, encourage innovation and improve coordination of unmanned systems across multiple domains. Leveraging the SCO developed standalone capabilities, the plan is to develop these capabilities for the initial LUSVs and then transition those capabilities into the LUSV through incremental development and integration across the funding portfolio, from an ICS that will be ready for combined and integrated capabilities, with the ICS infrastructure ready to support any future capabilities. Each subsequent increment will be back-compatible to upgrade previous increments, resulting in the first 8 LUSVs with a common and certified ICS that can be rapidly upgraded and modernized as necessary. The Navy will accomplish efforts under USV Enabling Capabilities through existing contract vehicles prepared for SCO and ONR efforts, the USV FoS Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) which will be awarded in FY 2020, the prime contract awarded for MUSV DD&C, the prime contract(s) awarded for LUSV DD&C and existing contracts for payload fabrication.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Combat Systems (ICS) Integration Development	Various	TBD : TBD	0.000	0.000		0.000		38.738	Jan 2020	-		38.738	Continuing	Continuing	Continuing
Consulting Services	WR	TBD : TBD	0.000	0.000		0.000		1.625	Jan 2020	-		1.625	Continuing	Continuing	Continuing
Elevated Sensors	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.750	Jan 2020	-		0.750	0.000	0.750	-
Experimentation	WR	Various : Various	0.000	0.000		0.000		3.500	Jan 2020	-		3.500	0.000	3.500	-
		Subtotal	0.000	0.000		0.000		44.613		-		44.613	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Autonomy	Various	Various : Various	0.000	0.000		0.000		0.750	Jan 2020	-		0.750	Continuing	Continuing	Continuing
Command and Control (C2) Integration	Various	Various : Various	0.000	0.000		0.000		1.500	Jan 2020	-		1.500	Continuing	Continuing	Continuing
USV Squadron Operations & Sustainment	WR	Various : Various	0.000	0.000		0.000		2.500	Jan 2020	-		2.500	Continuing	Continuing	Continuing
Delta Req, RFP Dev, Evaluation	WR	Various : Various	0.000	0.000		0.000		1.000	Jan 2020	-		1.000	0.000	1.000	-
		Subtotal	0.000	0.000		0.000		5.750		-		5.750	Continuing	Continuing	N/A

Management Services ($ in Millions)

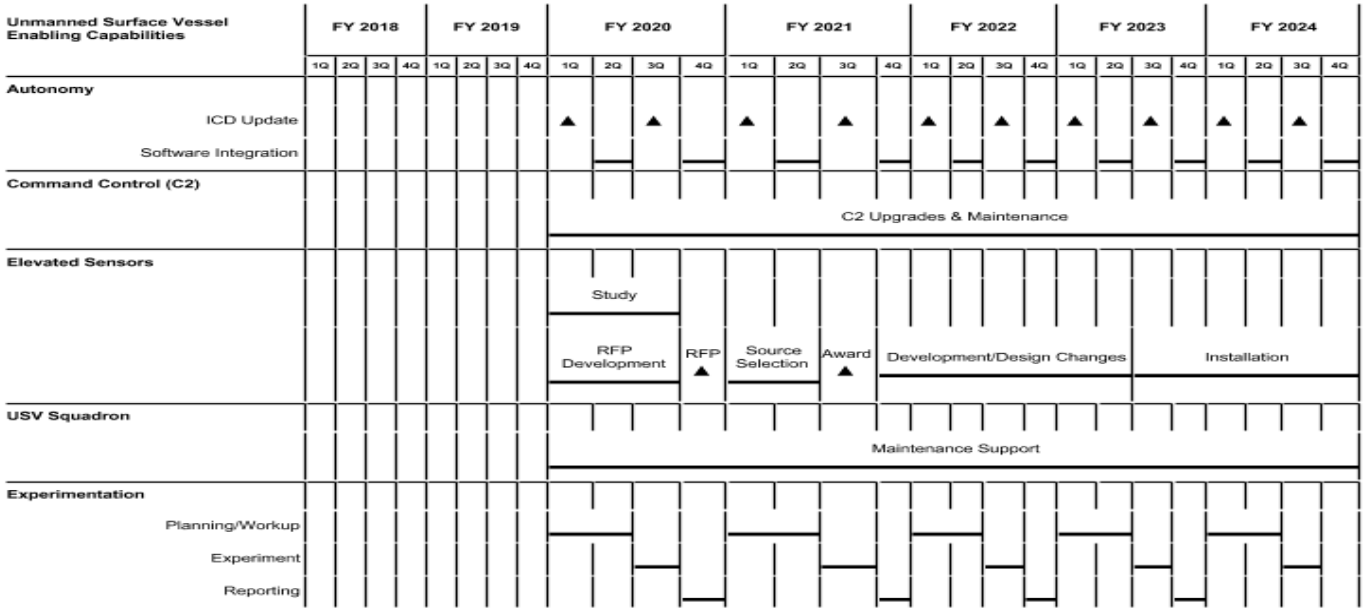
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	WR	NAVSEA : Washington, DC	0.000	0.000		0.000		0.050	Jan 2020	-		0.050	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.050		-		0.050	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3067 / *Unmanned Surface Vehicle Enabling Capabilities*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		50.413		-		50.413	Continuing	Continuing	N/A

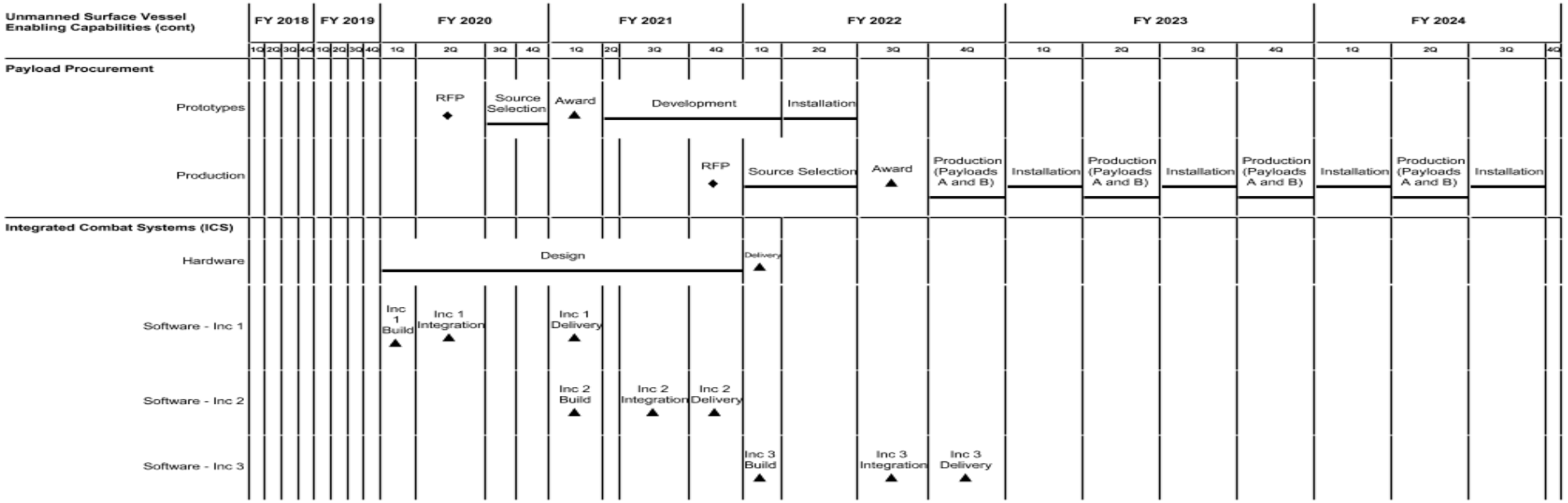
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*



2020PB - 0603502N - 3067

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*



2020PB - 0603502N - 3067

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Unmanned Surface Vessel Enabling Capabilities				
Autonomy: ICD Update: 1	1	2020	1	2020
Autonomy: ICD Update: 2	3	2020	3	2020
Autonomy: ICD Update: 3	1	2021	1	2021
Autonomy: ICD Update: 4	3	2021	3	2021
Autonomy: ICD Update: 5	1	2022	1	2022
Autonomy: ICD Update: 6	3	2022	3	2022
Autonomy: ICD Update: 7	1	2023	1	2023
Autonomy: ICD Update: 8	3	2023	3	2023
Autonomy: ICD Update: 9	1	2024	1	2024
Autonomy: ICD Update: 10	3	2024	3	2024
Autonomy: Software Integration: 1	2	2020	2	2020
Autonomy: Software Integration: 2	4	2020	4	2020
Autonomy: Software Integration: 3	2	2021	2	2021
Autonomy: Software Integration: 4	4	2021	4	2021
Autonomy: Software Integration: 5	2	2022	2	2022
Autonomy: Software Integration: 6	4	2022	4	2022
Autonomy: Software Integration: 7	2	2023	2	2023
Autonomy: Software Integration: 8	4	2023	4	2023
Autonomy: Software Integration: 9	2	2024	2	2024
Autonomy: Software Integration: 10	4	2024	4	2024
Command Control (C2): Command and Control (C2)	1	2020	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Elevated Sensors: Study	1	2020	3	2020
Elevated Sensors: RFP Solicitation Development	1	2020	3	2020
Elevated Sensors: RFP Release	4	2020	4	2020
Elevated Sensors: Source Selection	1	2021	2	2021
Elevated Sensors: Award	3	2021	3	2021
Elevated Sensors: Development/Design Changes	4	2021	2	2023
Elevated Sensors: Installation	3	2023	4	2024
USV Squadron: Maintenance Support	1	2020	4	2024
Experimentation: Planning/Workup: 1	1	2020	2	2020
Experimentation: Planning/Workup: 2	1	2021	2	2021
Experimentation: Planning/Workup: 3	1	2022	2	2022
Experimentation: Planning/Workup: 4	1	2023	2	2023
Experimentation: Planning/Workup: 5	1	2024	2	2024
Experimentation: Experiment: 1	3	2020	3	2020
Experimentation: Experiment: 2	3	2021	3	2021
Experimentation: Experiment: 3	3	2022	3	2022
Experimentation: Experiment: 4	3	2023	3	2023
Experimentation: Experiment: 5	3	2024	3	2024
Experimentation: Reporting: 1	4	2020	4	2020
Experimentation: Reporting: 2	4	2021	4	2021
Experimentation: Reporting: 3	4	2022	4	2022
Experimentation: Reporting: 4	4	2023	4	2023
Experimentation: Reporting: 5	4	2024	4	2024
Unmanned Surface Vessel Enabling Capabilities (cont)				
Payload Procurement: Prototypes: RFP Released	2	2020	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Payload Procurement: Prototypes: Source Selection	3	2020	4	2020
Payload Procurement: Prototypes: Award	1	2021	1	2021
Payload Procurement: Prototypes: Development	2	2021	1	2022
Payload Procurement: Prototypes: Installation	2	2022	2	2022
Payload Procurement: Production: RFP Released	4	2021	4	2021
Payload Procurement: Production: Source Selection	1	2022	2	2022
Payload Procurement: Production: Award	3	2022	3	2022
Payload Procurement: Production: Production 1	4	2022	4	2022
Payload Procurement: Production: Production 2	2	2023	2	2023
Payload Procurement: Production: Production 3	4	2023	4	2023
Payload Procurement: Production: Production 4	2	2024	2	2024
Payload Procurement: Production: Installation 1	1	2023	1	2023
Payload Procurement: Production: Installation 2	3	2023	3	2023
Payload Procurement: Production: Installation 3	1	2024	1	2024
Payload Procurement: Production: Installation 4	3	2024	3	2024
Integrated Combat Systems (ICS): Hardware: Virtual Combat Management System (VCMS) Design	1	2020	4	2021
Integrated Combat Systems (ICS): Hardware: VCMS Delivery	1	2022	1	2022
Integrated Combat Systems (ICS): Software - Inc 1: VCMS Inc 1 Software Build	1	2020	1	2020
Integrated Combat Systems (ICS): Software - Inc 1: VMCS Inc 1 System Integration & Virtualization	2	2020	2	2020
Integrated Combat Systems (ICS): Software - Inc 1: VCMS Inc 1 Delivery	1	2021	1	2021
Integrated Combat Systems (ICS): Software - Inc 2: VCMS Inc 2 Software Build	1	2021	1	2021
Integrated Combat Systems (ICS): Software - Inc 2: VCMS Inc 2 System Integration & Virtualization	3	2021	3	2021
Integrated Combat Systems (ICS): Software - Inc 2: VCMS Inc 2 Delivery	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3067 / *Unmanned Surface Vehicle Enabling Capabilities*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Integrated Combat Systems (ICS): Software - Inc 3: VCMS Inc 3 Software Build	1	2022	1	2022
Integrated Combat Systems (ICS): Software - Inc 3: VCMS Inc 3 Integration & Virtualization	3	2022	3	2022
Integrated Combat Systems (ICS): Software - Inc 3: VCMS Inc 3 Delivery	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3123: *SMCM UUV*	156.420	21.799	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	178.219
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY 2019 and future funding for Project 3123 is in Program Element (PE) 0604028N. Project realigned from PE 0603502N starting in FY 2019.

A. Mission Description and Budget Item Justification

As part of the UUV Family of Systems (FoS) and in support of the MCM MP, the Knifefish Surface Mine Countermeasures Unmanned Undersea Vehicle (SMCM UUV) program develops advanced Unmanned Undersea Vehicles (UUVs) to support clandestine mine detection capability against volume, bottom, and buried mines. Equipment includes vehicles and associated systems support equipment. In parallel, Pre-Planned Product Improvement (P3I) design efforts aligned to Fleet needs are ongoing to support insertion of incremental capability when the technology is ready. Planned P3I candidates being considered include increased detection range capability, communications upgrades, on-board sonar processing and target recognition, command and control improvements, increased operational depth, and other smaller tasks, as well as potential future payloads as required.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Knifefish SMCM UUV	21.799	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2019 Plans: Funding realigned to PE 0604028N.					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	21.799	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/2622: *Minesweeping Replacement*	57.343	32.367	19.448	-	19.448	15.858	16.281	16.753	17.087	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPN/1601: *LCS MCM Mission Modules*	45.146	98.901	197.129	-	197.129	222.831	222.523	233.151	243.503	1,213.078	2,655.367
• RDTEN/0604028N/3123: *SMCM UUV*	0.000	16.717	22.747	-	22.747	20.666	16.413	6.789	2.541	Continuing	Continuing
• OPN/1611: *Small and Medium UUVs*	0.000	0.000	40.547	-	40.547	38.817	24.310	8.564	35.170	Continuing	Continuing

Remarks

The above OPN funding lines account for several programs, of which the Knifefish program is only a portion.

D. Acquisition Strategy

The Knifefish program, initiated in FY11 and competitively sourced to General Dynamics Mission Systems (GDMS), develops Surface Mine Countermeasure Unmanned Undersea Vehicles (SMCM UUVs) equipped with advanced Low Frequency Broadband (LFBB) sonar to provide volume, bottom, and buried mine detection capability, when operated from the Littoral Combat Ship (LCS) Mine Countermeasure Mission Package (MCM MP) or Vessel of Opportunity (VOO). An Engineering Development Model (EDM) system was fabricated and tested through Developmental Testing (DT). After incorporating fixes and upgrades discovered during DT and from Fleet operator inputs, an Operational Assessment (OA) will be conducted from a VOO in order to inform a Milestone C (MS C) decision and Low Rate Initial Production (LRIP) award with an option for up to five Knifefish systems. An FRP Decision Review will be conducted after completion of Initial Operational Test and Evaluation (IOT&E) of the Knifefish system. Operational integration testing with the LCS will occur as test ships are available, but prior to Initial Operational Capability (IOC). Following IOT&E, a full and open competitive FRP contract will be awarded. The overall approach is to deliver systems through incrementally increasing capability via three block upgrades, balancing technology development maturity against a manageable level of risk to the program. Capability improvements via P3I will be developed concurrently within each block as baseline systems are produced. New P3I capability blocks will not transition to the production system until stable requirements are established, demonstrated, and verified for the respective P3I block. Originally designated an ACAT III program, Knifefish was directed to follow Accelerated Acquistion principles as part of the UUV Family of Systems (FoS) by the Assistant Secretary Navy for Research, Development, and Acquisition (ASN RDA) and the Chief of Naval Operations (CNO) in October 2017.

E. Performance Metrics

Successful Milestone C in 2Q FY 2019, FRP decision in 3Q FY 2020 and IOC in 4Q FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SMCM UOES Development	C/CPAF	BLUEFIN : CAMBRIDGE, MA	15.142	0.000		0.000		0.000		-		0.000	0.000	15.142	-
Knifefish Development	C/CPIF	Various : Various	17.497	0.000		0.000		0.000		-		0.000	0.000	17.497	-
Knifefish Development & Engineering Support	C/CPIF	General Dynamics AIS : McLeansville, NC	81.820	6.542	Dec 2017	0.000		0.000		-		0.000	0.000	88.362	-
Hardware/Software Development - Support Equipment	WR	NSWC, PC : PANAMA CITY, FL	5.429	0.237	Dec 2017	0.000		0.000		-		0.000	0.000	5.666	-
Knifefish P3I Development Contractor	C/CPIF	GDMS : McLeansville, NC	0.000	6.386	Dec 2017	0.000		0.000		-		0.000	0.000	6.386	-
		Subtotal	119.888	13.165		0.000		0.000		-		0.000	0.000	133.053	N/A

Remarks

FY 2019 and future funding has been realigned to Program Element (PE) 0604028N.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	WR	NSWC, PC : PANAMA CITY, FL	19.138	3.558	Dec 2017	0.000		0.000		-		0.000	0.000	22.696	-
Engineering Support	WR	NUWC, Newport : NEWPORT, RI	6.218	0.993	Dec 2017	0.000		0.000		-		0.000	0.000	7.211	-
Engineering Support	WR	VARIOUS : VARIOUS	4.792	0.610	Dec 2017	0.000		0.000		-		0.000	0.000	5.402	-
Engineering Support P3I	WR	NSWC, PC : PANAMA CITY, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Engineering Support P3I	WR	NUWC, Newport : NEWPORT, RI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Engineering Support P3I	WR	VARIOUS : VARIOUS	0.000	1.628	Dec 2017	0.000		0.000		-		0.000	0.000	1.628	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3123 / *SMCM UUV*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	30.148	6.789		0.000		0.000		-		0.000	0.000	36.937	N/A

Remarks

FY 2019 and future funding has been realigned to PE 0604028N.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NOMWC : STENNIS, MS	0.526	0.000		0.000		0.000		-		0.000	0.000	0.526	-
Government T&E Support	WR	VARIOUS : VARIOUS	1.329	0.000		0.000		0.000		-		0.000	0.000	1.329	-
Test and Evaluation	WR	COMOPTEVFOR : NORFOLK, VA	0.556	0.263	Dec 2017	0.000		0.000		-		0.000	0.000	0.819	-
Government T&E Support	WR	NSWC, PC : PANAMA CITY, FL	0.449	0.000		0.000		0.000		-		0.000	0.000	0.449	-
		Subtotal	2.860	0.263		0.000		0.000		-		0.000	0.000	3.123	N/A

Remarks

FY 2019 and future funding has been realigned to PE 0604028N.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	VARIOUS : WASHINGTON, DC	3.120	1.242	Feb 2018	0.000		0.000		-		0.000	0.000	4.362	-
Travel	WR	NAVSEA : WNY, DC	0.357	0.340	Dec 2017	0.000		0.000		-		0.000	0.000	0.697	-
Acquisition Workforce	WR	VARIOUS : VARIOUS	0.047	0.000		0.000		0.000		-		0.000	0.000	0.047	-
		Subtotal	3.524	1.582		0.000		0.000		-		0.000	0.000	5.106	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

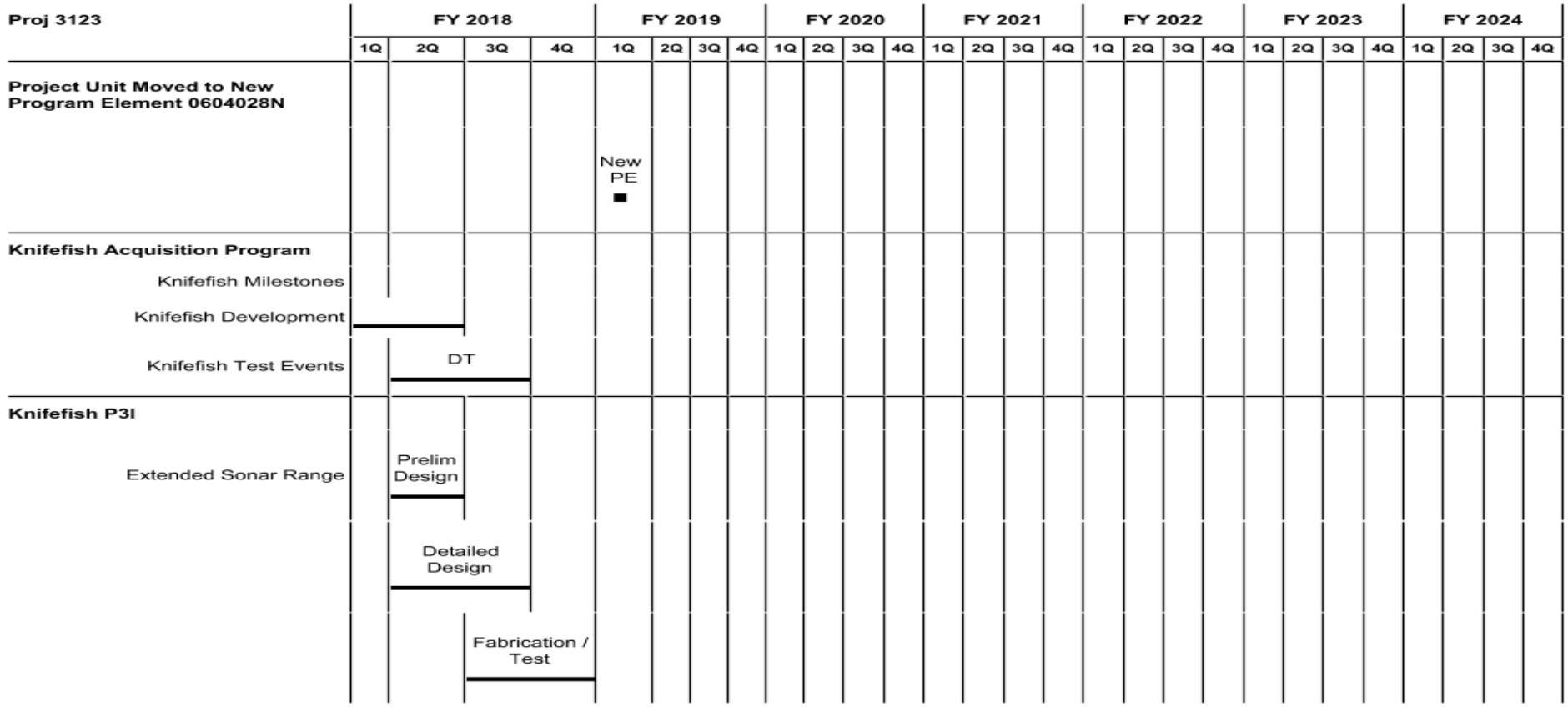
Remarks

FY 2019 and future funding has been realigned to PE 0604028N.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	156.420	21.799		0.000		0.000		-		0.000	0.000	178.219	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*



2020DON - 0603502N - 3123

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3123 / *SMCM UUV*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3123				
Project Unit Moved to New Program Element 0604028N:	1	2019	1	2019
Knifefish Acquisition Program: Knifefish Development:	1	2018	2	2018
Knifefish Acquisition Program: Knifefish Test Events: DT	2	2018	3	2018
Knifefish P3I: Extended Sonar Range: Extended Range Prelim Design	2	2018	2	2018
Knifefish P3I: Extended Sonar Range: Extended Range Detailed Design	2	2018	3	2018
Knifefish P3I: Extended Sonar Range: Extended Range Fabrication/Test	3	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3428 / *Medium Unmanned Surface Vehicle (MUSV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3428: *Medium Unmanned Surface Vehicle (MUSV)*	0.000	0.000	2.800	23.900	-	23.900	26.300	30.000	43.000	43.860	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY 2019, the Medium Unmanned Surface Vehicle (MUSV) received a Congressional Add of $42.000M in Project Unit 9999/C442. Efforts described here are directly supported by efforts in PU 9999/C442. In addition, the MUSV project leverages efforts external to this program element under Defense Advanced Research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV) and Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter projects.

A. Mission Description and Budget Item Justification

As part of the Unmanned Surface Vehicle (USV) Family of Systems (FoS), the Medium Unmanned Surface Vehicle (MUSV) project provides resources for the detailed design, fabrication, testing and support of the MUSV. MUSV is defined as having a reconfigurable mission capability which is accomplished via modular payloads with an initial mission capability to support Battlespace Awareness through Intelligence, Surveillance and Reconnaissance (ISR) and Electronic Warfare (EW). Modular payloads may be developed separately by other programs or prototyping efforts and will be further developed and/or integrated into MUSV under the Unmanned Surface Vessel Enabling Capabilities project unit that supports MUSV and LUSV. MUSVs will provide low cost, high endurance, reconfigurable ships able to accommodate various payloads for unmanned missions to augment the Navy's manned surface force.

MUSVs will support the Navy's ability to produce, deploy and disburse ISR/EW capabilities in sufficient quantities and provide/improve distributed situational awareness in maritime Areas of Responsibility (AORs). MUSVs will be designed to be attritable assets if used in a peer or near-peer conflict. MUSVs will initially be capable of semi-autonomous operation, with operators in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via the afloat element (i.e., embarked on a United States Navy (USN) combatant/support ship), or via the ashore element (C2 station ashore). MUSV C2, combat and/or weapon system integration will employ tamper proofing and security controls to prevent disclosure of data and electronic warfare defenses during autonomous operation. MUSVs will employ a Risk Management Framework (RMF) approach with physical, technical and administrative security controls. MUSVs will have hardware and software components to protect classified/sensitive functions, countermeasures designed to thwart adversary exploitation, classified data sanitation requirements, anti-tamper mechanisms to prevent disclosure of data and autonomous zeroization and electronic warfare defenses. MUSVs will be capable of weeks-long deployments and trans-oceanic transits, and operate aggregated with Carrier Strike Groups (CSGs) and Surface Action Groups (SAGs), as well as have the ability to deploy independently.

MUSV leverages efforts external to this project unit accomplished through Defense Advanced Research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV) and Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter investments in autonomy, endurance, command and control, payloads and testing in FY 2017 (continuing through FY 2021). Beginning in FY 2019, the Navy will commence transition of MDUSV Sea Hunter I and Sea Hunter II assets to Commander Naval Surface Forces under the MUSV project. In addition, the MUSV C2 concept directly leverages the fleet-ready C2 solution developed for unmanned surface vessels in the OSD SCO Ghost Fleet Overlord LUSV experimentation program.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3428 / *Medium Unmanned Surface Vehicle (MUSV)*

Future missions for MUSV will be informed by the Navy's Future Surface Combatant Force (FSCF) Analysis of Alternatives (AoA) and as concept of operations (CONOPs) are developed. There is an opportunity to increase medium sized payloads based on the findings from the AoA, and as technology develops. MUSV will be a key enabler of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy (alone or in teams/swarms), team with individual manned combatants or augment battle groups. Fielding of MUSV will provide the Navy increased capability and necessary capacity at lower procurement and sustainment costs, reduced risk to sailors and increased readiness by offloading missions from manned combatants.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	0.000	1.900	16.000	0.000	16.000
Articles:	-	-	-	-	-
FY 2019 Plans: Develop and finalize MUSV Top Level Requirements which documents the required warfighting capabilities; Issue a Request for Information to solicit industry feedback to help inform and finalize the Navy's initial Acquisition Strategy. Finalize Acquisition Strategy. Note: Congressional Add of $42.000M in Project Unit 9999/ C442 describes additional FY 2019 Plans culminating in the award of Detailed Design and Construction (DD&C) contract and Kick-off meeting.					
FY 2020 Base Plans: Continue to execute DD&C contract for MUSV prototype (contract award described under Congressional Add of $42.000M in Project Unit 9999/C442). Conduct System Readiness and System Functional Reviews. Evaluate and approve industry's preliminary and detailed designs for MUSV through Preliminary Design Review (PDR) and Critical Design Review (CDR). Procure materials in support of fabrication. Begin construction of hull and assembly of subcomponents. Begin software modifications to existing autonomy systems to comply with Navy requirements.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: Increase in funding from FY 2019 to FY 2020 is due to transition from requirements generation to detailed design and construction of MUSV. Note: Congressional Add of $42.000M in Project Unit 9999/C442 describes additional FY 2019 efforts.					
Title: Support	0.000	0.700	6.200	0.000	6.200
Articles:	-	-	-	-	-
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3428 / *Medium Unmanned Surface Vehicle (MUSV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The Navy will commence the transition of the ONR MDUSV/Sea Hunter program from the Office of Naval Research. The Navy will draft the transition plan from MDUSV/Sea Hunter program. Plans include the continued operation of the Sea Hunter I USV for technology demonstration, tactics development, sustainment planning, experimentation, CONOPs planning, and USV test planning. Note: Congressional Add of $42.000M in Project Unit 9999 describes additional FY 2019 Plans. ***FY 2020 Base Plans:*** The Navy will transition both Sea Hunter I and Sea Hunter II to Commander Naval Surface Forces through FY 2021. The Navy will prepare solicitations for Sea Hunter original equipment manufacturer (OEM) support and the development of training and maintenance documentation in preparation of fleet-based operations and sustainment. The Navy will provide systems engineering, design analysis, hull and assembly oversight, and integration support related to the execution of the DD&C contract. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding provides engineering support to the Detailed Design and Construction (DD&C) of MUSV #1.					
Title: Management Services	0.000	0.200	1.700	0.000	1.700
Articles:	-	-	-	-	-
FY 2019 Plans: Develop artifacts to support the approval of a MUSV DD&C contract award. This includes finalizing the Acquisition Strategy and completing the Acquisition Plan for MUSV. Note: Congressional Add of $42.000M in Project Unit 9999/C442 describes additional FY 2019 Plans. ***FY 2020 Base Plans:*** Develop all governing MUSV documentation as required to support advancement of the prototype program. This includes the creation of the following artifacts: System Engineering Plan (SEP), Test and Evaluation Strategy (TES), Life Cycle Support Plan (LCSP), Cybersecurity Strategy, Open Systems Architecture Management Plan, Corrosion Prevention and Control Plan, Weight Control Plan, Quality Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan and Program Protection Plan (PPP). The Navy will provide program management support related to the execution of the DD&C contract. ***FY 2020 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3428 / *Medium Unmanned Surface Vehicle (MUSV)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding provides management in support of the Detailed Design and Construction (DD&C) of MUSV #1.					
Accomplishments/Planned Programs Subtotals	0.000	2.800	23.900	0.000	23.900

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MUSV will pursue a Rapid Prototyping Program designation and follow a Middle Tier Acquisition approach per Section 804 of the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA), as amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note). Navy required capabilities will be captured in a Top Level Requirements (TLR) document approved by the OPNAV Director of Surface Warfare. A development RFP will be released to industry in FY 2019, containing options for additional USVs contingent on validation of warfighting requirements. A full and open procurement will take place in FY 2019, awarding a single MUSV prototype at the end of FY 2019 (Note: Congressional Add of $42.000M in Project Unit 9999/C442). The requirements of the MUSV will allow proposals from both traditional defense and commercial shipyards. Estimated delivery of the initial prototype will be FY 2022. Rapid prototyping efforts with the FY19 MUSV will inform procurement of additional MUSV units and eventual transition to an ACAT program and procurement funding.

E. Performance Metrics

Successful DD&C Contract Award in FY 2019 (Note: Congressional Add of $42.000M in Project Unit 9999/C442).
Successful testing and Military Utility Assessment (MUA) in FY 2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3428 / *Medium Unmanned Surface Vehicle (MUSV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Detailed Design & Construction	TBD	TBD : TBD	0.000	0.000		0.000		14.980	Jan 2020	-		14.980	0.000	14.980	-
Requirements Development	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.250	Dec 2018	0.000		-		0.000	0.000	0.250	-
Requirements Development	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.353	Dec 2018	0.000		-		0.000	0.000	0.353	-
Requirements Development	WR	SSC PAC : San Diego, CA	0.000	0.000		0.240	Dec 2018	0.000		-		0.000	0.000	0.240	-
Requirements Development	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.400	Dec 2018	0.000		-		0.000	0.000	0.400	-
Requirements Development	SS/CPFF	JHU APL : Laurel, MD	0.000	0.000		0.657	Jan 2019	0.000		-		0.000	0.000	0.657	-
Consulting Services	TBD	TBD : TBD	0.000	0.000		0.000		1.020	Jan 2020	-		1.020	0.000	1.020	-
		Subtotal	0.000	0.000		1.900		16.000		-		16.000	0.000	17.900	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	WR	Various : Various	0.000	0.000		0.000		3.840	Jan 2020	-		3.840	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.230	Dec 2018	0.480	Dec 2019	-		0.480	0.000	0.710	-
Engineering Support	WR	SSC PAC : San Diego, CA	0.000	0.000		0.240	Dec 2018	1.340	Dec 2019	-		1.340	0.000	1.580	-
Engineering Support	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.150	Dec 2018	0.180	Dec 2019	-		0.180	0.000	0.330	-
Engineering Support	SS/CPFF	JHU APL : Laurel, MD	0.000	0.000		0.080	Jan 2019	0.360	Dec 2019	-		0.360	0.000	0.440	-
		Subtotal	0.000	0.000		0.700		6.200		-		6.200	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 3428 / *Medium Unmanned Surface Vehicle (MUSV)*	

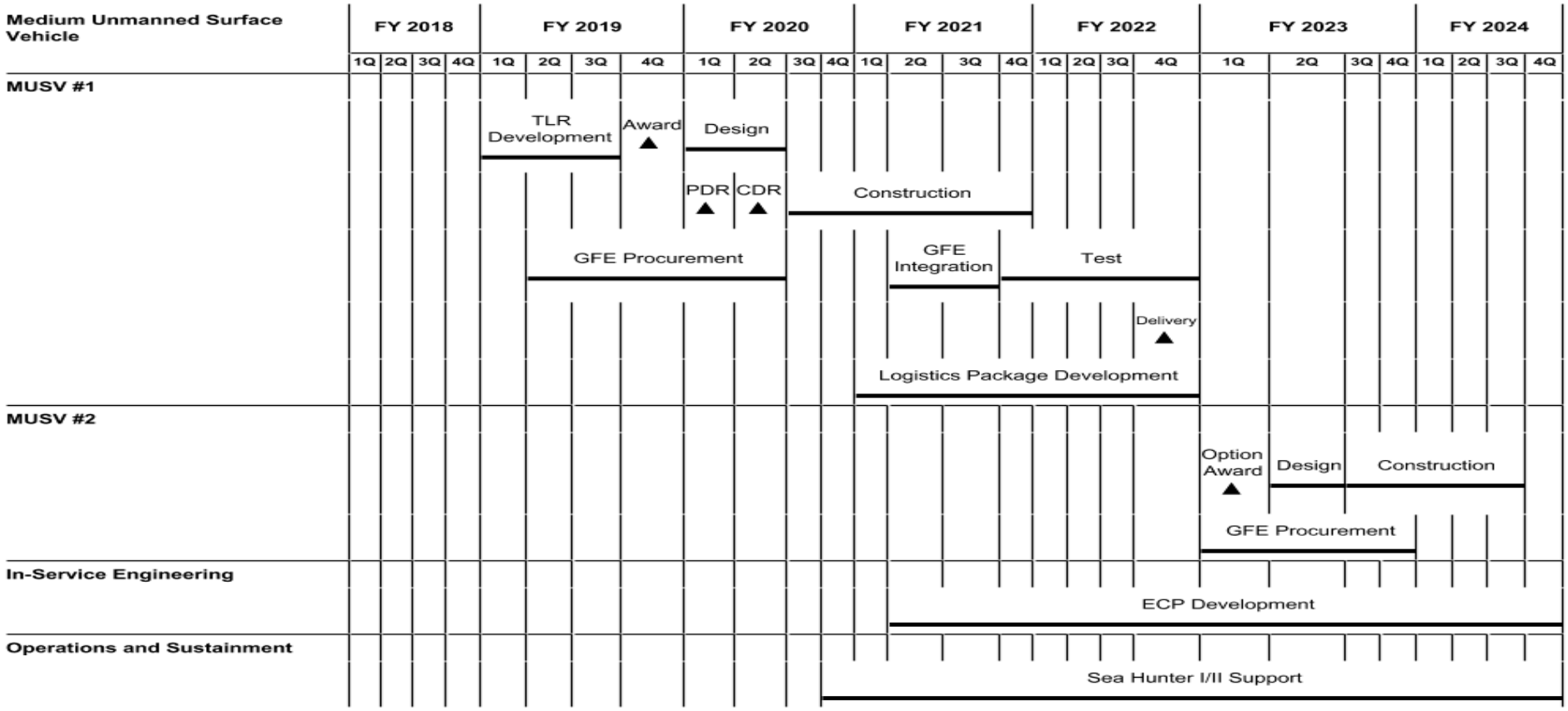
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Various : Washington, DC	0.000	0.000		0.200	Dec 2018	1.700	Dec 2019	-		1.700	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.200		1.700		-		1.700	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		2.800		23.900		-		23.900	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3428 / *Medium Unmanned Surface Vehicle (MUSV)*



2020PB - 0603502N - 3428

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 3428 / *Medium Unmanned Surface Vehicle (MUSV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Medium Unmanned Surface Vehicle				
MUSV #1: Top Level Requirements (TLR) Development	1	2019	3	2019
MUSV #1: Contract Award	4	2019	4	2019
MUSV #1: Detailed Design	1	2020	2	2020
MUSV #1: Preliminary Design Review (PDR)	1	2020	1	2020
MUSV #1: Critical Design Review (CDR)	2	2020	2	2020
MUSV #1: Construction	3	2020	4	2021
MUSV #1: Government Furnished Equipment (GFE) Procurement	2	2019	2	2020
MUSV #1: GFE Integration	2	2021	3	2021
MUSV #1: Test	4	2021	4	2022
MUSV #1: Delivery	4	2022	4	2022
MUSV #1: Logistics Package Development	1	2021	4	2022
MUSV #2: Option Award	1	2023	1	2023
MUSV #2: Design	2	2023	2	2023
MUSV #2: Construction	3	2023	3	2024
MUSV #2: GFE Procurement	1	2023	4	2023
In-Service Engineering: Engineering Change Proposal (ECP) Development	2	2021	4	2024
Operations and Sustainment: Sea Hunter I/II Support	4	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	12.546	60.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	72.646
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MUSV leverages efforts external to this project unit accomplished through Defense Advanced Research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV) and Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter investments in autonomy, endurance, command and control, payloads and testing in FY 2017 (continuing through FY 2021). Beginning in FY 2019, the Navy will commence transition of MDUSV Sea Hunter I and Sea Hunter II assets to Commander Naval Surface Forces under the MUSV project. In addition, the MUSV C2 concept directly leverages the fleet-ready C2 solution developed for unmanned surface vessels in the OSD SCO Ghost Fleet Overlord LUSV experimentation program.

This project also provides resources for development, improvement and integration of Unmanned Surface Vehicle (USV) Mine Countermeasure (MCM) systems. A description of the major planned programs includes the following:

The Unmanned Influence Sweep System (UISS) utilizes an Unmanned Surface Vehicle (USV) integrated with an Unmanned Surface Sweep System (US3), a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines, which can be deployed from the Littoral Combat Ship (LCS) or a Vessel of Opportunity (VOO).

The Mine Countermeasures Unmanned Surface Vehicle (MCM USV) program leverages the USV from the UISS Program of Record (PoR) and adds a modular mission capability through the addition of multiple payloads. MCM USV w/ AQS-20C integrates the existing AQS-20C minehunting sonar. MCM USV w/ AQS-24B continues the Minehunting efforts. In FY 2019 the MCM USV program began initial design efforts to support integration with a Mine Neutralization capability (Barracuda). Minesweeping payloads will be subsumed by the MCM USV PoR in FY 2020.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Congressional Add: Unmanned Influence Sweep System	12.546	0.000
FY 2018 Accomplishments: Product Development: Supported completion of CT and initial UISS Developmental Testing (DT) in support of Milestone C which is anticipated in 3Q FY 2019. During initial DT efforts, identified any design changes that are needed in support of follow on production efforts. Evaluated tech refresh product improvements. Support: Supported engineering, management, and integrated logistics for TDP, conducted Functional Configuration Audit (FCA), and Production Readiness Review (PRR). Prepared for a Milestone C decision in 3Q FY 2019 and prepared for Initial Operational Capability (IOC) in FY 2019.		

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Test & Evaluation: Began DT and prepared for LCS integration efforts for risk reduction and system verification in preparation for OA. Management: Oversaw ongoing contractor efforts. Managed efforts to get to Milestone C decision in 3Q FY 2019 and started preparations for IOC in FY 2019. ***FY 2019 Plans:*** N/A		
Congressional Add: Medium Displacement Unmanned Surface Vehicle ***FY 2018 Accomplishments:*** N/A ***FY 2019 Plans:*** Product Development: Generate and release Request for Proposal (RFP), including performance specification, for procurement of MUSV; and hold Industry Day; conduct source selection efforts; and award contract for Detailed Design and Construction (DD&C) of MUSV prototype; conduct Kick-off meeting. The Navy will develop the Acquisition Plan to support the procurement of two additional Overlord LUSVs and establishment of the Navy's LUSV program starting in FY 2020. The Navy will develop cost estimates based on the results of the Overlord Agreements being executed by OSD SCO. Conduct Warfighting analysis utilizing Navy Warfare Centers and Federally Funded Research and Development Centers (FFRDCs) to develop requirements and understand design trade space for the LUSV. Support: PEO USC will assume development and construction oversight of the Sea Hunter II USV. Management Services: Creation of a MUSV Prototyping Plan.	0.000	42.000
Congressional Add: Navy Identified MCM USV Requirement ***FY 2018 Accomplishments:*** N/A ***FY 2019 Plans:*** Product Development: Complete initial design and software development efforts for craft and payload integration, command and control, and operations. Continue system level testing. Prepare to conduct User Operational Evaluation System (UOES) Employment. Prepare and support design changes for initial Developmental Testing (DT). Conduct technical feasibility studies, trade study analysis, tactics development, requirements definition and USV impact studies for Mine Neutralization (Barracuda) integration with MCM USV. Begin contractor integration testing of MCM USV w/ AQS-24B and MCM USV w/ AQS-20C.	0.000	14.100

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019
Support: Continue program management, engineering and technical support for payload integration and testing efforts. Support testing and User Operational Evaluation System (UOES) efforts for the assessment of system capabilities to determine Military utility. Determine initial spares required for upcoming DT/UOES test events. Management Services: Provide program planning, management and acquisition document updates for the MCM USV program.		
Congressional Add: Navy Identified UISS Requirement ***FY 2018 Accomplishments:*** N/A ***FY 2019 Plans:*** Product Development: Complete UISS DT, complete UISS Operational Assessment (OA), and achieve Milestone C, which is now anticipated in 3Q FY 2019. Develop Engineering Change Proposals (ECPs) for EDM and Low Rate Initial Production (LRIP) units in preparation for integration testing and Initial Operational Test and Evaluation (IOT&E). Conduct systems engineering efforts in support of program and test efforts. Support: Support engineering, management and logistics efforts for MS C in 3Q FY 2019 and Initial Operational Capability (IOC) in 4Q FY 2019. Prepare for IOT&E. Continue development of Full Rate Production (FRP) documentation to release Request for Proposal (RFP) in late FY 2019. Test and Evaluation: Complete UISS DT and OA in support of MS C decision in 3Q FY 2019. Conduct UISS system level IOT&E in support of FRP decision planned for FY 2020. Management Services: Oversee ongoing contractor efforts. Manage MS C documentation completion. Manage FRP RFP release and proposal evaluation.	0.000	4.000
Congressional Adds Subtotals	12.546	60.100

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• RDTE/0603502N/1234: *Unmanned Surface Vehicle (USV)*	14.989	28.645	31.519	-	31.519	19.105	18.943	19.331	19.715	Continuing	Continuing
• RDTE/0603502N/3428: *Medium Unmanned Surface Vehicle (MDUSV)*	0.000	2.800	23.900	-	23.900	26.300	30.000	43.000	43.860	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

MUSV will pursue a Rapid Prototyping Program designation and follow a Middle Tier Acquisition approach per Section 804 of the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA), as amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note). Navy required capabilities will be captured in a Top Level Requirements (TLR) document approved by the OPNAV Director of Surface Warfare. A development RFP will be released to industry in FY 2019, containing options for additional USVs contingent on validation of warfighting requirements. A full and open procurement will take place in FY 2019, awarding a single MUSV prototype at the end of FY 2019 (Note: Congressional Add of $42.000M in Project Unit 9999/C442). The requirements of the MUSV will allow proposals from both traditional defense and commercial shipyards. Estimated delivery of the initial prototype will be FY 2022. Rapid prototyping efforts with the FY19 MUSV will inform procurement of additional MUSV units and eventual transition to an ACAT program and procurement funding.

UISS requirements are documented in the Unmanned Influence Sweep System (UISS) Capability Production Document (CPD). An Engineering and Manufacturing Development (E&MD) contract was awarded in FY 2014 with options for Low Rate Initial Production (LRIP) in FY 2019.

In FY 2019, MCM USV is developing a CDD leveraging existing requirements (UISS, AN/AQS-20, MCM MP, etc.). In FY 2020, MCM USV anticipates a Full Rate Production (FRP) decision and will conduct a full and open competition for FRP contract(s).

E. Performance Metrics

MUSV - Successful Material Development Decision in FY 2020. Successful RET execution in FY 2021. CDD-V and RFP release in FY 2022.

UISS - Successfully reach Milestone C in FY 2019. Award LRIP options in FY 2019.

MCM USV - Achieve FRP Decision in FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / *Surface & Shallow Water MCM*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Product Devlopment	C/CPIF	Textron Systems, Inc. : Hunt Valley, MD	0.000	7.663	Jan 2018	1.391	Jan 2019	0.000		-		0.000	0.000	9.054	-
MCM USV: Product Development	C/CPFF	Textron Systems, Inc. : Hunt Valley, MD	0.000	0.000		12.500	Mar 2019	0.000		-		0.000	0.000	12.500	-
MUSV: Product Development	C/FPIF	TBD : TBD	0.000	0.000		38.138	Sep 2019	0.000		-		0.000	0.000	38.138	-
MUSV: Product Development	WR	SSC LANT : Charleston, SC	0.000	0.000		0.249	Jan 2019	0.000		-		0.000	0.000	0.249	-
MUSV: Product Development	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.887	Dec 2018	0.000		-		0.000	0.000	0.887	-
MUSV: Product Development	WR	SSC PAC : San Diego, CA	0.000	0.000		2.000	Feb 2019	0.000		-		0.000	0.000	2.000	-
		Subtotal	0.000	7.663		55.165		0.000		-		0.000	0.000	62.828	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Engineering Support	WR	NUWC N : Newport, RI	0.000	0.188	Dec 2017	0.100	Jan 2019	0.000		-		0.000	0.000	0.288	-
UISS: Engineering Support	WR	NSWC PC : Panama City, FL	0.000	2.000	Dec 2017	0.600	Jan 2019	0.000		-		0.000	0.000	2.600	-
UISS: Engineering Support	WR	NSWC CD : Bethesda, MD	0.000	0.500	Dec 2017	0.000		0.000		-		0.000	0.000	0.500	-
UISS: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.000	0.314	Dec 2017	0.000		0.000		-		0.000	0.000	0.314	-
UISS: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.000	0.266	Dec 2017	0.000		0.000		-		0.000	0.000	0.266	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Engineering Support	C/CPFF	Textron Systems, Inc. : Hunt Valley, MD	0.000	0.000		1.301	Mar 2019	0.000		-		0.000	0.000	1.301	-
MUSV: Engineering Support	WR	SSC LANT : Charleston, SC	0.000	0.000		0.165	Jan 2019	0.000		-		0.000	0.000	0.165	-
MUSV: Integrated Logistics	WR	TBD : TBD	0.000	0.000		0.080	Aug 2019	0.000		-		0.000	0.000	0.080	-
		Subtotal	0.000	3.268		2.246		0.000		-		0.000	0.000	5.514	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Test and Evaluation	WR	NSWC PC : Panama City, FL	0.000	0.045	Dec 2017	0.400	Jan 2019	0.000		-		0.000	0.000	0.445	-
UISS: Test and Evaluation	WR	NSWC CD : Bethesda, MD	0.000	1.300	Dec 2017	1.000	Jan 2019	0.000		-		0.000	0.000	2.300	-
UISS: Test and Evaluation	C/CPFF	Textron Systems, Inc. : Hunt Valley, MD	0.000	0.020	Dec 2017	0.000		0.000		-		0.000	0.000	0.020	-
		Subtotal	0.000	1.365		1.400		0.000		-		0.000	0.000	2.765	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Travel	WR	NAVSEA : Washington, DC	0.000	0.040	Jan 2018	0.100	Mar 2019	0.000		-		0.000	0.000	0.140	-
UISS: Management	WR	TBD : TBD	0.000	0.210	Nov 2017	0.409	Nov 2018	0.000		-		0.000	0.000	0.619	-
MCM USV: Management	WR	TBD : TBD	0.000	0.000		0.299	Mar 2019	0.000		-		0.000	0.000	0.299	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

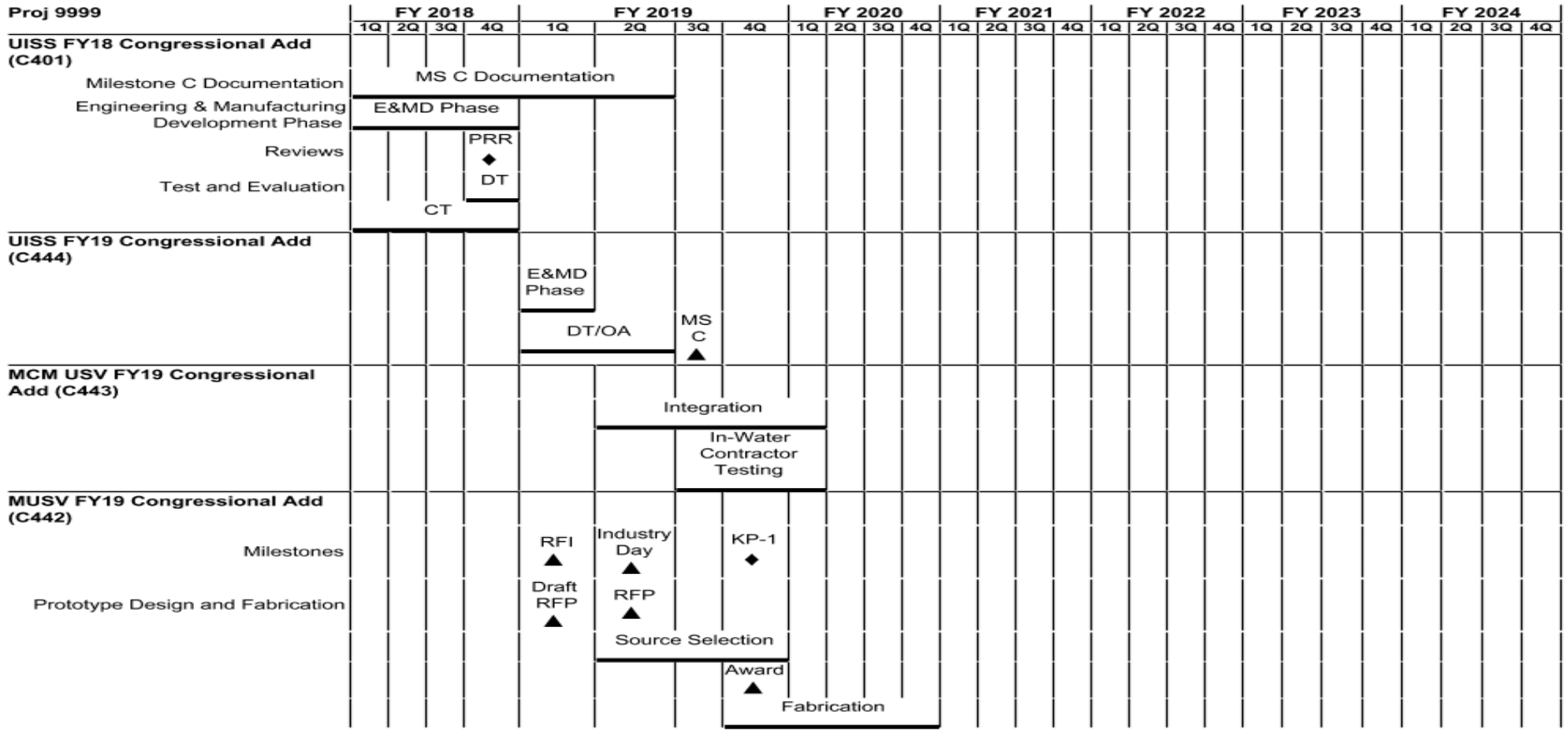
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MUSV: Travel	WR	NAVSEA : Washington, DC	0.000	0.000		0.151	Mar 2019	0.000		-		0.000	0.000	0.151	-
MUSV: Management	WR	TBD : TBD	0.000	0.000		0.330	Mar 2019	0.000		-		0.000	0.000	0.330	-
		Subtotal	0.000	0.250		1.289		0.000		-		0.000	0.000	1.539	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	12.546		60.100		0.000		-		0.000	0.000	72.646	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*



2020PB - 0603502N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
UISS FY18 Congressional Add (C401): Milestone C Documentation: Milestone C Documentation	1	2018	2	2019
UISS FY18 Congressional Add (C401): Engineering & Manufacturing Development Phase: Engineering & Manufacturing Development Phase	1	2018	4	2018
UISS FY18 Congressional Add (C401): Reviews: Production Readiness Review (PRR)	4	2018	4	2018
UISS FY18 Congressional Add (C401): Test and Evaluation: Developmental Testing	4	2018	4	2018
UISS FY18 Congressional Add (C401): Test and Evaluation: Contractor Testing	1	2018	4	2018
UISS FY19 Congressional Add (C444): Engineering & Manufacturing Development Phase	1	2019	1	2019
UISS FY19 Congressional Add (C444): DT/OA Testing	1	2019	2	2019
UISS FY19 Congressional Add (C444): Milestone C	3	2019	3	2019
MCM USV FY19 Congressional Add (C443): Craft/Payload Integration	2	2019	1	2020
MCM USV FY19 Congressional Add (C443): In-Water Contractor Testing	3	2019	1	2020
MUSV FY19 Congressional Add (C442): Milestones: Industry RFI	1	2019	1	2019
MUSV FY19 Congressional Add (C442): Milestones: Industry Day	2	2019	2	2019
MUSV FY19 Congressional Add (C442): Milestones: Knowledge Point 1	4	2019	4	2019
MUSV FY19 Congressional Add (C442): Prototype Design and Fabrication: Draft RFP Released	1	2019	1	2019
MUSV FY19 Congressional Add (C442): Prototype Design and Fabrication: RFP Released	2	2019	2	2019
MUSV FY19 Congressional Add (C442): Prototype Design and Fabrication: Source Selection	2	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603502N / *Surface & Shallow Water MCM*	**Project (Number/Name)** 9999 / *Congressional Adds*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MUSV FY19 Congressional Add (C442): Prototype Design and Fabrication: Contract Award	4	2019	4	2019
MUSV FY19 Congressional Add (C442): Prototype Design and Fabrication: Design & Fabrication	4	2019	4	2020