Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604518N *I Combat Information Center Conv*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	59.666	18.626	16.094	12.718	-	12.718	12.188	11.787	11.607	11.834	Continuing	Continuing
3094: *USW Decision Support*	59.666	8.826	8.594	10.325	-	10.325	10.598	10.299	10.497	10.702	Continuing	Continuing
3439: *Project NAUTICA: Integrated Theater ASW C4I*	0.000	9.800	7.500	2.393	-	2.393	1.590	1.488	1.110	1.132	Continuing	Continuing

A. Mission Description and Budget Item Justification

NOTE: The FY 2021 funding request was reduced (since the previous President's Budget submit) by $1.000 million to account for the availability of prior year execution balances under Project 3439.

This Program Element (PE) addresses the development and integration of new and improved technologies into the Anti-Submarine Warfare (ASW) and Theater Undersea Warfare (TUSW) Command & Control (C2) systems supporting the warfighter.

The FY 2020 ($16.094M) to FY 2021 ($12.718M) net decrease ($-3.376M) in this PE is due to the following changes at the Project level: 1) Project 3094 - Increase of $+1.731M to account for the increase in the scope of work in Undersea Warfare Decision Support System (USW-DSS) Build 3 Fleet Capability Request-2 (FCR-2) in FY 2021, driven by planned interface changes required for USW-DSS to remain interoperable with the latest AN/SQQ-89(V) Surface ASW Combat System and Consolidated Afloat Networks and Enterprise Services (CANES) configurations, as well as additional system re-architecture effort involved with the implementation of Chief of Naval Operations (CNO) direction, starting in FY 2021, to transition USW-DSS FCRs to a more agile Compile to Combat in 24 Hours (C2C24) software development process; and 2) Project 3439 - Decrease of ($-5.107M) to account for planned reduced program requirements and associated reduced planned systems engineering scope in FY 2021.

PROJECT 3094: Undersea Warfare Decision Support System (USW-DSS) is the Navy Program of Record ASW C2 Net-Centric system supporting the warfighter. In FY 2021, USW-DSS will continue to develop and test the software changes and perform the certification testing necessary to address end of life (EOL) support issues impacting USW-DSS Build 3 as well as address emerging mandated cybersecurity requirements. Additionally in FY 2021, funding will be used to develop, design, integrate, and test additional USW-DSS tools/capabilities for Build 3 including, but not limited to: Common Tactical Picture (CTP), Platform Data Fusion Integration, Cross-Platform Data Fusion, Automated Asset Allocation, Asset/Threat State Information, Vulnerability Analysis enhancement, ASW Track Management, Automated Re-planning, Engagement Target Pairing, improved TASW capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporating the electronic Master Tactical Plot (eMTP) visualization/display service on which to render the CTP/Common Operational Picture (COP). These improvements address requirements from the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017).

As a result of the Chief of Naval Operations (CNO) direction to implement a Compile to Combat in 24 Hours (C2C24) software development process, USW-DSS Build 3 FCR-2 and FCR-3 schedules have been revised to reflect required system re-architecture efforts, which necessitated shifting of the Design, Development, Integration/ Test, and Certification Test phases.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604518N *I Combat Information Center Conv*

PROJECT 3439: The Networked Architecture for Undersea Theater Integrated C2 Advantage (NAUTICA) Project provides Theater Anti-Submarine Warfare (TASW) architecture development, systems engineering, and design. FY 2021 continues the system engineering effort required to design, develop and deliver an integrated TASW battle management suite in accordance with the 2007 Anti-Submarine Warfare (ASW) Initial Capabilities Document (ICD). The plan prioritizes NAUTICA investments in accordance with the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017) and Center for Security Forces (CSF) letter "Criticality of Sustaining PMI and WSM Capability and Meeting Emerging Requirements for Great Competition" submitted to OPNAV N2N6. The design of the integrated TASW battle management suite will include a system of systems TASW architecture to enable the existing programs of record under development from the Program Executive Offices (PEOs) for Integrated Warfare Systems (IWS), PEO Command, Controls, Communications, Computers and intelligence (C4I), PEO AIR, PEO SUB, and N9SP to exploit a common framework. The common architecture will define the key data exchanges, common displays and processing, data models, cross domain interfaces, and multi-level security software that will enable systems such as USW-DSS and the Distributed Common Ground System - Navy (DCGS-N) to exchange, display, and exploit information at the appropriate classifications.

NAUTICA TASW Phase II and III schedules have been updated to reflect the System of Systems (SoS) design process by removing the previously separate Design Specifications, Development, Rapid Prototyping, and Integration/Test phases and incorporating those efforts into a singular Systems Engineering phase.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	19.263	16.094	13.637	-	13.637
Current President's Budget	18.626	16.094	12.718	-	12.718
Total Adjustments	-0.637	0.000	-0.919	-	-0.919
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.637	0.000			
• Program Adjustments	0.000	0.000	-1.000	-	-1.000
• Rate/Misc Adjustments	0.000	0.000	0.081	-	0.081

Change Summary Explanation

FUNDING CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:
- FY 2019 decrease of $-0.637M due to Small Business Innovative Research (SBIR) transfer.
- FY 2021 decrease of $-0.919M due to accounting for the availability of prior year execution balances ($-1.000M) under Project 3439 and general and Navy Working Capital Fund (NWCF) specific rate adjustments ($+0.081M) against Projects 3094 and 3439.

PROJECT 3094 - FY 2020 TO FY 2021 BUDGET REQUEST INCREASE:

- FY 2020 ($8.594M) to FY 2021 ($10.325M) increase ($+1.731M) accounts for the increase in the scope of work in Undersea Warfare Decision Support System (USW-DSS) Build 3 Fleet Capability Request-2 (FCR-2) in FY 2021, driven by planned interface changes required for USW-DSS to remain interoperable with the latest AN/SQQ-89(V) Surface ASW Combat System and Consolidated Afloat Networks and Enterprise Services (CANES) configurations, as well as additional system re-architecture effort involved with the implementation of Chief of Naval Operations (CNO) direction, starting in FY 2021, to transition USW-DSS FCRs to a more agile Compile to Combat in 24 Hours (C2C24) software development process.

PROJECT 3094 - SCHEDULE CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET:
As a result of CNO direction to implement/transition USW-DSS FCRs to a more agile C2C24 software development process, USW-DSS Build 3 FCR-2 and FCR-3 schedules have been revised to reflect additional required system re-architecture efforts, which necessitated the shifting of the Design, Development, Integration/Test, and Certification Test phases.

USW-DSS Build 3 FCR-2:
- Completion of Development phase extended from 3Q21 to 2Q22.
- Integration/Test phase shifted from 1Q21-2Q22 to 4Q21-1Q23.
- Certification Test phase shifted from 2Q22-4Q22 to 1Q23-3Q23.

USW-DSS Build 3 FCR-3:
- Design phase shifted from 4Q21-3Q22 to 3Q22-2Q23.
- Development phase shifted from 3Q22-4Q23 to 2Q23-3Q24.
- Initiation of Integration/Test phase shifted from 4Q23 to 3Q24.

PROJECT 3439 - FY 2020 TO FY 2021 BUDGET REQUEST DECREASE:
- FY 2020 ($7.500M) to FY 2021 ($2.393M) decrease ($-5.107M) reflects the completion of NAUTICA Phase I Model Based System Engineering in FY 2020 and planned reduced program requirements and associated reduced planned systems engineering scope in FY 2021.

PROJECT 3439 - SCHEDULE CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET:

NAUTICA TASW Phase II and III schedules have been updated to reflect the System of Systems (SoS) design process by removing the previously separate Design Specifications, Development, Rapid Prototyping, and Integration/Test phases and incorporating those efforts into a singular Systems Engineering phase.

NAUTICA TASW Phase II High Side Sensor Fusion:
- Completion of System Engineering phase extended from 1Q22 to 3Q22 (to reflect inclusion of Design Specifications, Rapid Prototyping, and Integration/Test phases).
- Removed Design Specifications, Rapid Prototyping, and Integration/Test phases (now included within the singular System Engineering phase).

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604518N *I Combat Information Center Conv*

NAUTICA TASW Phase III TASW as a Service:
- Completion of System Engineering phase extended from 1Q24 to 4Q25 (to reflect inclusion of Design Specifications, Development, Rapid Prototyping, and Integration/Test phases).
- Removed Design Specifications, Development, and Rapid Prototyping phases (now included within the singular System Engineering phase).

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3094 / *USW Decision Support*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3094: *USW Decision Support*	59.666	8.826	8.594	10.325	-	10.325	10.598	10.299	10.497	10.702	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Undersea Warfare Decision Support System (USW-DSS) is the Navy Program of Record ASW C2 Net-Centric system supporting the warfighter. USW-DSS provides an integrated, near-real time, net-centric ASW Common Tactical Picture (CTP) and Common Operational Picture (COP) for the Carrier Strike Groups (CSGs). USW-DSS is a C2 capability identified in the ASW Initial Capabilities Document (ICD), for the Sea Combat Commander (SCC) and Theater USW Commander (TUSWC). USW-DSS enables effective planning and execution of Undersea Warfare (USW) operations, optimizes placement of sensors for exploitation of the environment, manages available resources, balances operations versus risk, and provides a clear vulnerability assessment of the operational environment. USW-DSS shortens C2 decision processes for detection-to-engagement across multiple platforms, including those with low-bandwidth communications or intermittent connectivity. Tactical data such as tracks, environmental, and sensor processing data is ingested into USW-DSS through platform specific interfaces such as the AN/SQQ-89(V) Surface Ship ASW Combat System, the Global Command and Control System - Maritime (GCCS-M), and Aircraft Carrier Tactical Support Center (CV-TSC). USW-DSS processes this and other tactical data and supports intelligent dissemination of the data to unit level and theater level platforms in support of an enhanced USW tactical picture. USW-DSS provides USW Commanders with an expanded, net-centric USW collaborative capability across CSG platforms (CVNs, CGs, DDGs) as well as supporting shore nodes to include Commander Task Force (CTF), the Naval Oceanographic Processing Facility (NOPF), and Tactical Operations Center (TOC) and Mobile Tactical Operations Center (M-TOC). On afloat platforms, USW-DSS processing software is virtualized for portability and is hosted on the Consolidated Afloat Networks and Enterprise Services (CANES) system and implements a Service-Oriented Architecture (SOA) with display generation and operator interfaces provided via USW-DSS hardware. For support and ashore nodes, USW-DSS processing software is hosted on Commercial Off The Shelf (COTS) hardware.

Future USW-DSS capability is phased to deliver timely and cost-effective software improvements to the warfighter via the Build / Fleet Capability Release (FCR) process. USW-DSS Build 3 FCR incremental developments will implement cost effective cyber security and Theater ASW (TASW) functionality by integrating inputs from data sources and platforms such as the P8-A Poseidon aircraft and associated Air ASW sensors, provide improved and additional functionality, and improve stability and reliability. USW-DSS Build 3 will provide common and improved visualization, integrated USW platform sensor data sharing, reduced data entry, improved sensor performance predictions, data fusion, and reduced redundancy across USW Tactical Decision Aids (TDAs). The program will provide a greater understanding of the undersea battle space by allowing the entire force (carrier and expeditionary strike group, theater, or other) to have a common and thorough understanding of the battle space with characterized uncertainties. The Navy continues to modernize and add sensor capabilities to existing Programs of Record that are significant data sources of information for USW-DSS. These include, but are not limited to the AN/SQQ-89 Surface Ship ASW Combat System, the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC), the Global Command and Control System - Maritime (GCCS-M), and the Distributed Common Ground System - Navy (DCGS-N). As the sensor capabilities and systems mature, the tactical data valuable to USW-DSS is incorporated as part of a future FCR. Through targeted architectural improvements, follow-on FCRs will facilitate the migration of select components of USW-DSS to a DoD commercial cloud computing environment, thus improving software performance and scalability while keeping future hardware costs in check. Additionally, follow-on FCRs are targeted to support operations across different security enclaves and additional platform tactical data interfaces such as those associated with P-8A Poseidon aircraft, submarine, and Integrated Undersea Surveillance System (IUSS) fixed sensors. Additionally, USW-DSS is adopting agile Information Technology (IT) developments to align with the Compile to Combat in 24 Hours (C2C24) initiative.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

In FY 2021, USW-DSS will continue to develop and test the software changes and perform the certification testing necessary to address end of life (EOL) support issues impacting USW-DSS Build 3 as well as address emerging mandated cybersecurity requirements. Additionally in FY 2021, funding will be used to develop, design, integrate, and test additional USW-DSS tools/capabilities for Build 3 including, but not limited to: CTP, Platform Data Fusion Integration, Cross-Platform Data Fusion, Automated Asset Allocation, Asset/Threat State Information, Vulnerability Analysis enhancement, ASW Track Management, Automated Re-planning, Engagement Target Pairing, improved TASW capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporating the electronic Master Tactical Plot (eMTP) visualization/ display service on which to render the CTP/COP. These improvements address requirements from the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: USW-DSS Capability Improvements	8.826	8.594	10.325	0.000	10.325
Articles:	-	-	-	-	-
Description: Design, develop, integrate, and test additional USW-DSS tools/capabilities for Build 3 including Common Tactical Picture (CTP), Platform Data Fusion integration, Cross-Platform Data Fusion, Theater Level Mission Planning, Automated Asset Allocation, Asset/Threat State Information, Vulnerability Analysis enhancement, Anti-Submarine Warfare (ASW) Track Management, Automated Re-planning, Engagement Target Pairing, improved Theater Undersea Warfare (TUSW) capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporation of the Electronic Master Tactical Plot (eMTP) visualization/display service, and cyber security protection requirements.					
FY 2020 Plans: - Close-out the formal development cycle of FCR-1, including certification and test of FCR-1. - Through capability drops and demonstrations at Commander Task Force (CTF) sites, gather feedback and develop system employment manuals for effective use of the system for each CTF. - Continue design and begin development activities of FCR-2 to include software development, integration, and test activities and associated System Engineering Technical Reviews (SETR) to assess the technical and programmatic maturity of development efforts. - Continue prototype efforts necessary to begin hosting USW-DSS shore-based applications in a DoD commercial cloud computing environment to meet emerging requirements. Effort will support required software changes, integration with a new host computing environment, and testing in the new computing environment.					
FY 2021 Base Plans: - Continue to gather feedback and develop system employment manuals for effective use of the system for shore sites and ships through capability drops and demonstrations at shore sites.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Continue formal development cycle of FCR-2, including software development (initiating the C2C24 framework), integration, and test activities, and conduct associated SETRs. - Initiate interface change design efforts with the AN/SQQ-89(V) Surface ASW Combat System and develop/test compatibility with CANES configurations. - Continue prototype efforts necessary to begin hosting USW-DSS shore-based applications in a DoD commercial cloud computing environment to meet emerging cyber requirements. Effort will support required software changes, integration with a new host computing environment, and testing in the new computing environment. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 ($8.594M) to FY 2021 ($10.325M) increase ($+1.731M) is driven by an increase in the scope of work in Undersea Warfare Decision Support System (USW-DSS) Build 3 Fleet Capability Request-2 (FCR-2) in FY 2021, driven by planned interface changes required for USW-DSS to remain interoperable with the latest AN/SQQ-89(V) Surface ASW Combat System and Consolidated Afloat Networks and Enterprise Services (CANES) configurations, as well as additional system re-architecture effort involved with the implementation of Chief of Naval Operations (CNO) direction, starting in FY 2021, to transition USW-DSS FCRs to a more agile Compile to Combat in 24 Hours (C2C24) software development process.					
Accomplishments/Planned Programs Subtotals	8.826	8.594	10.325	0.000	10.325

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• OPN/2176: *USW Support Equipment (N2N6/USW-DSS only)*	7.305	6.017	7.262	-	7.262	8.736	11.786	12.022	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

- Hardware/Software development and integration via Navy Warfare Centers and Small Business contractors.
- Utilize Small Business Innovative Research (SBIR) funding and development efforts for open competition on capability improvements to reach Technology Readiness Level (TRL) 5/6.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

- Utilize Other Transactional Authority (OTA) to expedite prototype development.
- Invest in maturing SBIR developed technologies beyond TRL 5/6 for integration into USW-DSS and Theater Anti-Submarine Warfare (TASW) systems via SBIR Phase III contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Capability Enhancements - Development	C/CPFF	Adaptive Methods : VA	2.309	2.416	Dec 2018	2.126	Dec 2019	2.552	Dec 2020	-		2.552	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	C/CPFF	DH Wagner : PA	0.000	0.400	Jan 2019	0.408	Jan 2020	0.516	Dec 2020	-		0.516	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NSWC/Carderock : MD	1.508	1.484	Nov 2018	1.514	Nov 2019	1.914	Nov 2020	-		1.914	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NSWC/Dahlgren : VA	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
USW-DSS Capability Enhancements - Development	WR	NUWC/Keyport : WA	0.738	1.139	Nov 2018	1.162	Nov 2019	1.455	Nov 2020	-		1.455	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NUWC/Newport : RI	1.040	0.436	Nov 2018	0.445	Nov 2019	0.562	Nov 2020	-		0.562	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	C/CPFF	Progeny : VA	2.121	1.964	Dec 2018	1.941	Jan 2020	2.343	Dec 2020	-		2.343	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	C/CPFF	UT/ARL : TX	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
USW-DSS Capability Enhancements - Development	Various	Var : Var*	49.405	0.385	Dec 2018	0.384	Dec 2019	0.588	Dec 2020	-		0.588	Continuing	Continuing	Continuing
		Subtotal	57.537	8.224		7.980		9.930		-		9.930	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Capability Enhancements - Integration/Certification/ Test	C/CPFF	Adaptive Methods : VA	0.450	0.204	Dec 2018	0.208	Dec 2019	0.110	Dec 2020	-		0.110	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Integration/Certification/ Test	C/CPFF	Progeny : VA	1.249	0.254	Dec 2018	0.259	Dec 2019	0.135	Dec 2020	-		0.135	Continuing	Continuing	Continuing
		Subtotal	1.699	0.458		0.467		0.245		-		0.245	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.143	0.084	Dec 2018	0.086	Jan 2020	0.000		-		0.000	0.000	0.313	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	TBD (CACI Follow On) : TBD	0.000	0.000		0.000		0.088	Dec 2020	-		0.088	Continuing	Continuing	Continuing
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	0.287	0.040	Nov 2018	0.041	Jan 2020	0.000		-		0.000	0.000	0.368	-
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	TBD (CGI Federal Follow On) : TBD	0.000	0.000		0.000		0.042	Dec 2020	-		0.042	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.000	0.020	Jan 2019	0.020	Nov 2019	0.020	Dec 2020	-		0.020	Continuing	Continuing	Continuing
		Subtotal	0.430	0.144		0.147		0.150		-		0.150	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3094 / *USW Decision Support*	

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	59.666	8.826		8.594		10.325		-		10.325	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

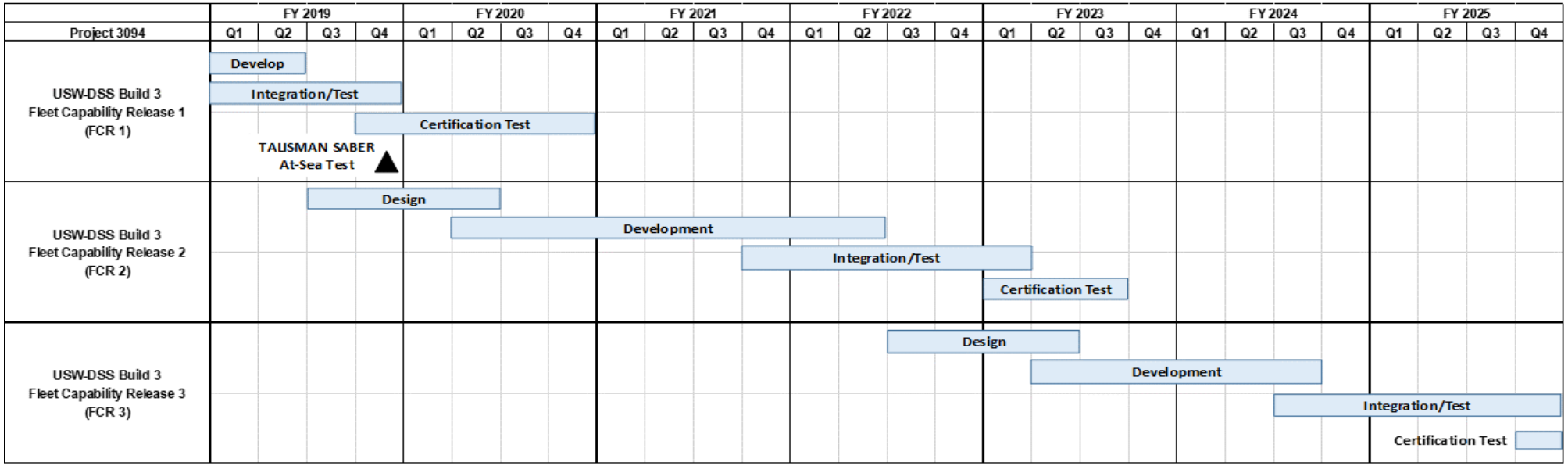

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3094				
USW-DSS Build 3 Fleet Capability Release 1 (FCR-1): Development	1	2019	2	2019
USW-DSS Build 3 Fleet Capability Release 1 (FCR-1): Integration/Test	1	2019	4	2019
USW-DSS Build 3 Fleet Capability Release 1 (FCR-1): Certification Test	4	2019	4	2020
USW-DSS Build 3 Fleet Capability Release 1 (FCR-1): TALISMAN SABER At-Sea Test	4	2019	4	2019
USW-DSS Build 3 Fleet Capability Release 2 (FCR-2): Design	3	2019	2	2020
USW-DSS Build 3 Fleet Capability Release 2 (FCR-2): Development	2	2020	2	2022
USW-DSS Build 3 Fleet Capability Release 2 (FCR-2): Integration/Test	4	2021	1	2023
USW-DSS Build 3 Fleet Capability Release 2 (FCR-2): Certification Test	1	2023	3	2023
USW-DSS Build 3 Fleet Capability Release 3 (FCR-3): Design	3	2022	2	2023
USW-DSS Build 3 Fleet Capability Release 3 (FCR-3): Development	2	2023	3	2024
USW-DSS Build 3 Fleet Capability Release 3 (FCR-3): Integration/Test	3	2024	4	2025
USW-DSS Build 3 Fleet Capability Release 3 (FCR-3): Certification Test	4	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3439 / *Project NAUTICA: Integrated Theater ASW C4I*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3439: *Project NAUTICA: Integrated Theater ASW C4I*	0.000	9.800	7.500	2.393	-	2.393	1.590	1.488	1.110	1.132	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Networked Architecture for Undersea Theater Integrated C2 Advantage (NAUTICA) Project provides Theater Anti-Submarine Warfare (TASW) architecture development, systems engineering, and design. NAUTICA will identify requirements to integrate intelligence (operational and tactical) and sensor (national and organic) systems to provide a fully informed Naval Integrated Fires Control Counter Undersea (NIFC-CU) Common Operational Picture (COP) of enemy undersea forces, maximizing decision superiority and theater level planning, and address TASW C2. Using Model-Based Systems Engineering (MBSE), NAUTICA will decompose warfighting requirements into system requirements allocated to existing Programs of Record or identified as new program requirements. Theater Undersea Warfare Operations Center's (TUSWOC) systems today are not integrated to support performance requirements during all threat levels. This results in failure to most effectively employ Theater USW assets. Near term, the Project will continue to accelerate development by rapidly prototyping the framework for existing legacy systems to be federated, to exchange key information and significantly improve existing TASW capability. NAUTICA will also establish a transition path for new USW technologies such as the Operational Planning Tool (OPT), Water Space Planner (WASP), Battle Management TDA, and other Future Naval Capabilities (FNCs) that will start to transition Technology Readiness Level (TRL) 5/6 enabling technologies into the USW-DSS and Distributed Common Ground System - Navy (DCGS-N) Programs of Record.

FY 2021 continues the system engineering effort required to design, develop and deliver an integrated TASW battle management suite in accordance with the 2007 ASW Initial Capabilities Document (ICD). The plan prioritizes NAUTICA investments in accordance with the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017) and Center for Security Forces (CSF) letter "Criticality of Sustaining PMI and Water Space Management (WSM) Capability and Meeting Emerging Requirements for Great Competition" submitted to OPNAV N2N6. The design of the integrated TASW battle management suite will include a system of systems TASW architecture to enable the existing programs of record under development from the Program Executive Offices (PEOs) for Integrated Warfare Systems (IWS), PEO Command, Controls, Communications, Computers and intelligence (C4I), PEO AIR, PEO SUB, and N9SP to exploit a common framework. The common architecture will define the key data exchanges, common displays and processing, data models, cross domain interfaces, and multi-level security software that will enable systems such as USW-DSS and DCGS-N to exchange, display, and exploit information at the appropriate classifications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: NAUTICA - Theater Architecture Development and System Integration	9.800	7.500	2.393	0.000	2.393
Articles:	-	-	-	-	-
Description: This program is responsible for the analysis of the Theater Anti-Submarine Warfare (TASW) Command Center System of Systems (SoS), design, and planning. The effort will make specific recommendations for the design and development of the interfaces and test procedures for the systems being					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
developed under separate Programs of Record. Specifically, the Global Command and Control System - Maritime (GCCS-M), Undersea Warfare Decision Support System (USW-DSS), Distributed Common Ground System - Navy (DCGS-N), and Maritime Tactical Command & Control-2 (MTC-2) systems have evolved on separate timelines. This program will develop near term solutions and propose a long range plan for these systems. The investment will design the interfaces that will federate the systems to close the gaps. The objective is to replace the manpower-intense operations with machine-to-machine interfaces, and then assess the warfighting benefit of integration to inform future decisions. This investment addresses TASW Command and Control (C2) needs identified in the ASW Initial Capabilities Document (ICD). ***FY 2020 Plans:*** - Continue TASW Phase I Federation of Systems design specifications and rapid prototyping, and initiate development efforts. - Continue system engineering by developing TASW use cases. - Continue to evolve the data exchanges between P-8A Poseidon aircraft and TASW. - Incorporate Naval Oceanographic Office (NAVO) and Commander Navy Meteorology and Oceanography Command (CNMOC) data. - Identify interfaces necessary to implement multi-level coalition data exchanges. - Assess requirements for an enterprise cloud-computing environment. - Continue Office of Naval Research (ONR) Water Space Planner (WaSP) Tech Candidate and Future Naval Capabilities (FNC) rapid prototyping. - Design and develop the data exchange specifications necessary between systems to support blue force management such as incorporation of WaSP and Prevention of Mutual Interference (PMI) tools. - Design and develop the data exchanges necessary between systems to support early incorporation of TASW platforms such as submarines and Integrated Undersea Surveillance Systems (IUSS). - Complete the interface design specifications necessary to implement multi-level coalition data exchanges. ***FY 2021 Base Plans:*** - Complete TASW Phase I Federation of Systems development and rapid prototyping, and initiate integration and test efforts. - Initiate TASW Phase II High Side Sensor Fusion requirements definition and systems engineering efforts. - Allocate gap requirements from Model-Based Systems Engineering (MBSE) efforts to Programs of Record. - Continue to identify interfaces necessary to implement multi-level coalition data exchanges.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Develop the system artifacts required for data exchange between systems to support blue force management such as incorporation of WaSP and PMI tools. - Complete the requirements assessment for an enterprise cloud-computing environment for TASW. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2020 ($7.500M) to FY 2021 ($2.393M) decrease ($-5.107M) reflects the completion of NAUTICA Phase I Model Based System Engineering in FY 2020 and planned reduced program requirements and systems engineering scope in FY 2021.					
Accomplishments/Planned Programs Subtotals	9.800	7.500	2.393	0.000	2.393

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

- Theater architecture development and system integration initiative that provides the transition funding for Office of Naval Research (ONR) Future Naval Capabilities (FNC) investments, for Water Space Management (WSM) and including Battlespace Management Tactical Decision Aids (TDAs).
- Capabilities developed under Small Business Innovative Research (SBIR) and FNC investments are incorporated into Theater ASW (TASW) Programs of Record, such as USW-DSS, through incremental Fleet Capability Releases (FCRs).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Adaptive Methods : VA	0.000	0.850	Dec 2018	0.638	Jan 2020	0.262	Dec 2020	-		0.262	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	COMNAVAIRPAC : CA	0.000	0.210	Jan 2019	0.158	Jan 2020	0.070	Nov 2020	-		0.070	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	DH Wagner : PA	0.000	0.100	Jan 2019	0.075	Jan 2020	0.033	Dec 2020	-		0.033	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Carderock : MD	0.000	0.750	Dec 2018	0.563	Jan 2020	0.249	Nov 2020	-		0.249	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Dahlgren : VA	0.000	0.445	Dec 2018	0.334	Jan 2020	0.148	Nov 2020	-		0.148	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Keyport : WA	0.000	1.273	Dec 2018	0.955	Nov 2019	0.212	Nov 2020	-		0.212	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Newport : RI	0.000	0.888	Dec 2018	0.666	Dec 2019	0.150	Nov 2020	-		0.150	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	WR	NIWC : CA	0.000	0.280	Jan 2019	0.210	Nov 2019	0.093	Nov 2020	-		0.093	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	UT/ARL : TX	0.000	1.774	Dec 2018	1.331	Jan 2020	0.295	Dec 2020	-		0.295	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Various : Var*	0.000	2.190	Jan 2019	1.499	Dec 2019	0.333	Dec 2020	-		0.333	Continuing	Continuing	Continuing
		Subtotal	0.000	8.760		6.429		1.845		-		1.845	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.000	0.095	Dec 2018	0.097	Jan 2020	0.000		-		0.000	0.000	0.192	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	TBD (CACI Follow On) : TBD	0.000	0.000		0.000		0.099	Dec 2020	-		0.099	Continuing	Continuing	Continuing
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal* : VA	0.000	0.915	Dec 2018	0.944	Jan 2020	0.000		-		0.000	0.000	1.859	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	TBD (CGI Federal Follow On) : TBD	0.000	0.000		0.000		0.418	Dec 2020	-		0.418	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.000	0.030	Jan 2019	0.030	Jan 2020	0.031	Dec 2020	-		0.031	Continuing	Continuing	Continuing
		Subtotal	0.000	1.040		1.071		0.548		-		0.548	Continuing	Continuing	N/A

Remarks

*In addition to program office support, CGI Federal provides technical planning, systems engineering and test support.

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	9.800		7.500		2.393		-		2.393	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
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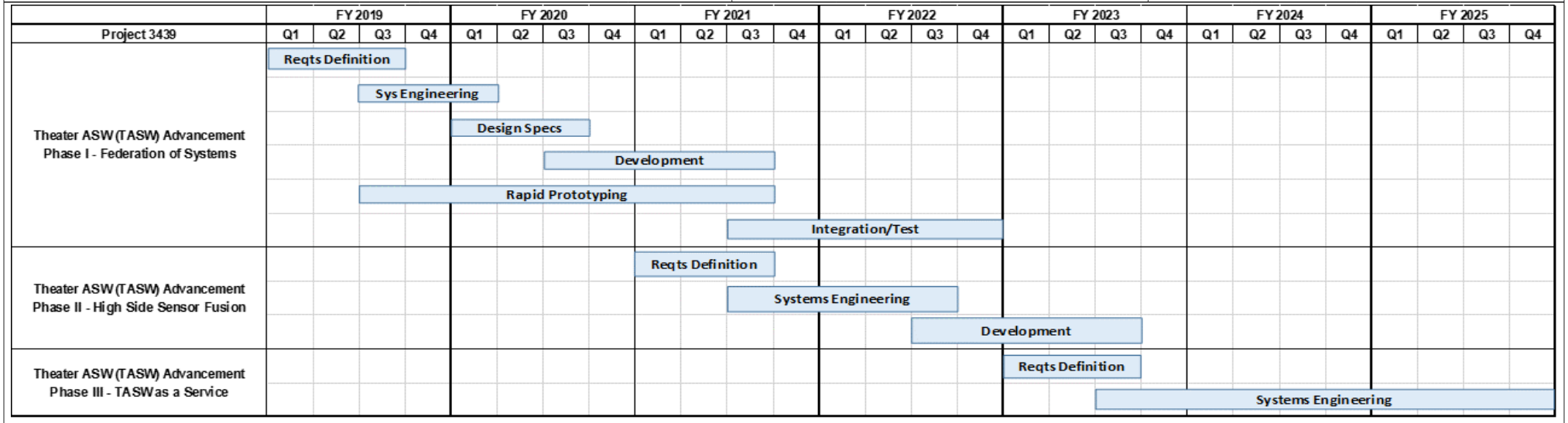

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3439				
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Requirements Definition	1	2019	3	2019
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Systems Engineering	3	2019	1	2020
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Design Specifications	1	2020	3	2020
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Development	3	2020	3	2021
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Rapid Prototyping	3	2019	3	2021
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Integration/Test	3	2021	4	2022
Theater ASW (TASW) Advancement Phase II - High Side Sensor Fusion: Requirements Definition	1	2021	3	2021
Theater ASW (TASW) Advancement Phase II - High Side Sensor Fusion: Systems Engineering	3	2021	3	2022
Theater ASW (TASW) Advancement Phase II - High Side Sensor Fusion: Development	3	2022	3	2023
Theater ASW (TASW) Phase III - TASW As A Service: Requirements Definition	1	2023	3	2023
Theater ASW (TASW) Phase III - TASW As A Service: Systems Engineering	3	2023	4	2025