Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	78.292	15.478	12.661	11.631	-	11.631	-	-	-	-	-	-
3094: *USW Decision Support*	68.492	8.272	10.279	10.198	-	10.198	-	-	-	-	-	-
3439: *Project NAUTICA: Integrated Theater ASW C4I*	9.800	7.206	2.382	1.433	-	1.433	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

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.

PROJECT 3094: Undersea Warfare Decision Support System (USW-DSS) is the Navy Program of Record ASW C2 Net-Centric system supporting the warfighter. USW-DSS continues 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, USW-DSS will develop, design, integrate, and test additional tools/ capabilities for Build 3 including, but not limited to: Waterspace Prevention of Mutual Interference (PMI), Common Track Manager, Link 16 Connectivity, 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 Fleet Capability Release (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. USW-DSS Build 3 FCR 2 and FCR 3 schedules have also been revised to reflect a push for commonality between afloat and ashore USW-DSS systems and continuous development improvements impacting both shipboard and Theater Undersea Warfare Command Headquarter (TUSWCHQ) watch floors instead of a staggered FCR 2 (afloat) and FCR 3 (ashore) improvement plan previously envisioned. This schedule revision will drive the acquisition of cutting-edge ASW tools to local and theater ASW commanders faster and with more interoperability.

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, and 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.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	16.094	12.718	12.188	-	12.188
Current President's Budget	15.478	12.661	11.631	-	11.631
Total Adjustments	-0.616	-0.057	-0.557	-	-0.557
• Congressional General Reductions	-	-0.057			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.616	0.000			
• Program Adjustments	0.000	0.000	-0.090	-	-0.090
• Rate/Misc Adjustments	0.000	0.000	-0.467	-	-0.467

Change Summary Explanation

FUNDING CHANGES SINCE FY 2021 BUDGET AT THE OVERALL PE LEVEL:
- FY 2020 decrease ($-0.616M) is the result of the Small Business Innovative Research (SBIR) transfer.
- FY 2021 decrease ($-0.057M) is the result of the fair-share application of a Congressional undistributed reduction.
- FY 2022 decrease ($-0.557M) is due to the application of contract services savings and the incorporation of Navy Working Capital Fund (NWCF) and miscellaneous rate adjustments.

PROJECT 3094 - FY 2021 TO PB22 REQUEST DECREASE:
- FY 2021 ($10.279M) to FY 2022 ($10.198M) decrease ($-0.081M) is due to the application of contract services savings and the incorporation of NWCF rate adjustments.

PROJECT 3094 - SCHEDULE CHANGES SINCE FY 2021 BUDGET:
- USW-DSS Build 3 FCR 1 was expanded to include the Waterspace PMI requirement including Development, Integration/Test, and Test Certification events.
- USW-DSS Build 3 FCR 2 and FCR 3 schedules have been revised to reflect a push for commonality between afloat and ashore USW-DSS systems and continuous development improvements impacting both shipboard and TUSWCHQ watch floors instead of a staggered FCR 2 (afloat) and FCR 3 (ashore) improvement plan previously envisioned. This schedule revision will drive the acquisition of cutting-edge ASW tools to local and theater ASW commanders faster and with more interoperability.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
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*

- USW-DSS Build 3 FCR 2 was extended, driven by the requirement to implement Waterspace PMI into FCR 1. FCR 2 will now deliver agile continuous improvement driving more overlapping development, integration, and delivery through Development, Security, and Operations (DevSecOps).
- USW-DSS Build 3 FCR 3 has been adjusted to follow the same cadence driven by DevSecOps in Build 3 FCR 2.

PROJECT 3439 - FY 2021 TO PB22 DECREASE:
- FY 2021 ($2.382M) to FY 2022 ($1.433M) decrease ($-0.949M) reflects the completion of NAUTICA Phase I development and rapid prototyping efforts.

PROJECT 3439 - SCHEDULE CHANGES SINCE FY 2021 BUDGET:
NAUTICA TASW Phase II High Side Sensor Fusion:
- Initiate the Development phase in Q4 FY 2021 vice Q3 FY 2022.
- Include Integration/Test phase starting in Q1 FY 2023.

NAUTICA TASW Phase III TASW as a Service:
- Include Development and Integration/Test phases.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
3094: *USW Decision Support*	68.492	8.272	10.279	10.198	-	10.198	-	-	-	-	-	-
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 Maritime Operations Center (MOC). 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 2022 Navy		Date: May 2021
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 2022, USW-DSS will continue to address end of life (EOL) support issues impacting USW-DSS Build 3 as well as address emerging mandated cybersecurity requirements. Funding will be used to continue to develop, design, integrate, and test additional USW-DSS tools/capabilities for Build 3 including, but not limited to: Waterspace PMI, Common Track Manager, Link 16 Connectivity, 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: USW-DSS Capability Improvements	8.272	10.279	10.198	0.000	10.198
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 2021 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. - Close out the formal development cycle for FCR 1 (capability drops 5 through 9) including certification. - Implement basic Waterspace Prevention of Mutual Interference (PMI) capability to TUSW Headquarters (TUSWCHQ) Secret and Top Secret networks. Continue development of advanced PMI and dynamic Waterspace Management capability to de-conflict submerged operations, and weapons release. - Continue formal development cycle of FCR 2, including software development (initiating the C2C24 framework), integration, and test activities, and conduct associated System Engineering Technical Reviews (SETR). - Initiate interface change design efforts with the AN/SQQ-89(V) Surface ASW Combat System and develop/test compatibility with CANES configurations.					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Expand the use of DoD commercial cloud computing environment to facilitate rapid prototyping, agile software development, capability drop integration and testing. Effort will support the development and testing of USW-DSS Build 3 afloat (FCR 2) requirements prior to CANES integration. ***FY 2022 Base Plans:*** - Continue development and testing of FCR 2 increment of USW-DSS. Transition capability drop schedule from two (2) total capability drops per year at TUSWCHQ or afloat sites to two (2) capability drops per year at both TUSWCHQ and afloat sites. - Continue development and transition of Adaptive Anti-Submarine Warfare (AASW) improved submarine search and sensor analysis toolsets. - Initiate development and transition of ONR Battle Management Technical Decision Aid (BAM TDA) within USW-DSS capability drop baseline. - Continue to develop and test interfaces to AN/SQQ-89(V) Surface ASW Combat System and various CANES configurations. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The FY 2021 ($10.279M) to FY 2022 ($10.198M) decrease ($-0.081M) reflects the application of service contract savings.					
Accomplishments/Planned Programs Subtotals	8.272	10.279	10.198	0.000	10.198

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPN/2176: *USW Support Equipment (N2N6/USW-DSS only)*	6.017	6.508	8.668	-	8.668	-	-	-	-	-	-

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 2022 Navy		Date: May 2021
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.
- Integrate technically-mature Office of Naval Research Technology Candidates and Future Naval Capabilities that meet technology gaps identified by NAUTICA into USW-DSS baseline.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Capability Enhancements - Development	C/CPFF	Adaptive Methods : VA	4.725	2.026	Dec 2019	1.245	Feb 2021	1.250	Dec 2021	-		1.250	-	-	-
USW-DSS Capability Enhancements - Development	C/CPFF	DH Wagner : PA	0.400	0.408	Jan 2020	0.400	Mar 2021	0.375	Dec 2021	-		0.375	-	-	-
USW-DSS Capability Enhancements - Development	WR	NIWC/Pacific : CA	0.000	0.000		1.200	Mar 2021	1.500	Dec 2021	-		1.500	-	-	-
USW-DSS Capability Enhancements - Development	WR	NSWC/Carderock : MD	2.992	1.414	Nov 2019	0.477	Mar 2021	0.500	Nov 2021	-		0.500	-	-	-
USW-DSS Capability Enhancements - Development	WR	NSWC/Dahlgren : VA	0.150	0.000		0.000		0.000		-		0.000	-	-	-
USW-DSS Capability Enhancements - Development	WR	NUWC/Keyport : WA	1.877	1.162	Nov 2019	0.515	Nov 2020	0.550	Nov 2021	-		0.550	-	-	-
USW-DSS Capability Enhancements - Development	WR	NUWC/Newport : RI	1.476	0.445	Nov 2019	3.417	Nov 2020	3.400	Nov 2021	-		3.400	-	-	-
USW-DSS Capability Enhancements - Development	C/CPFF	Progeny : VA	4.085	1.941	Jan 2020	0.604	Mar 2021	0.600	Dec 2021	-		0.600	-	-	-
USW-DSS Capability Enhancements - Development	C/CPFF	UT/ARL : TX	0.266	0.000		0.000		0.000		-		0.000	-	-	-
USW-DSS Capability Enhancements - Development	Various	Var : Var*	49.790	0.262	Dec 2019	2.026	Nov 2020	1.593	Dec 2021	-		1.593	-	-	-
		Subtotal	65.761	7.658		9.884		9.768		-		9.768	-	-	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 2022 Navy			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Capability Enhancements - Integration/Certification/ Test	C/CPFF	Adaptive Methods : VA	0.654	0.208	Dec 2019	0.110	Dec 2020	0.115	Dec 2021	-		0.115	-	-	-
USW-DSS Capability Enhancements - Integration/Certification/ Test	C/CPFF	Progeny : VA	1.503	0.259	Dec 2019	0.135	Dec 2020	0.150	Dec 2021	-		0.150	-	-	-
		Subtotal	2.157	0.467		0.245		0.265		-		0.265	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.227	0.086	Jan 2020	0.000		0.000		-		0.000	-	-	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.000	0.000		0.088	Mar 2021	0.090	Dec 2021	-		0.090	-	-	-
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal* : VA	0.327	0.041	Jan 2020	0.000		0.000		-		0.000	-	-	-
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.000	0.000		0.042	Feb 2021	0.050	Dec 2021	-		0.050	-	-	-
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.020	0.020	Nov 2019	0.020	Dec 2020	0.025	Oct 2021	-		0.025	-	-	-
		Subtotal	0.574	0.147		0.150		0.165		-		0.165	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
*In addition to program office support, CGI Federal/KMS Solutions provide technical planning, systems engineering, and test support.															

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	68.492	8.272		10.279		10.198		-		10.198	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

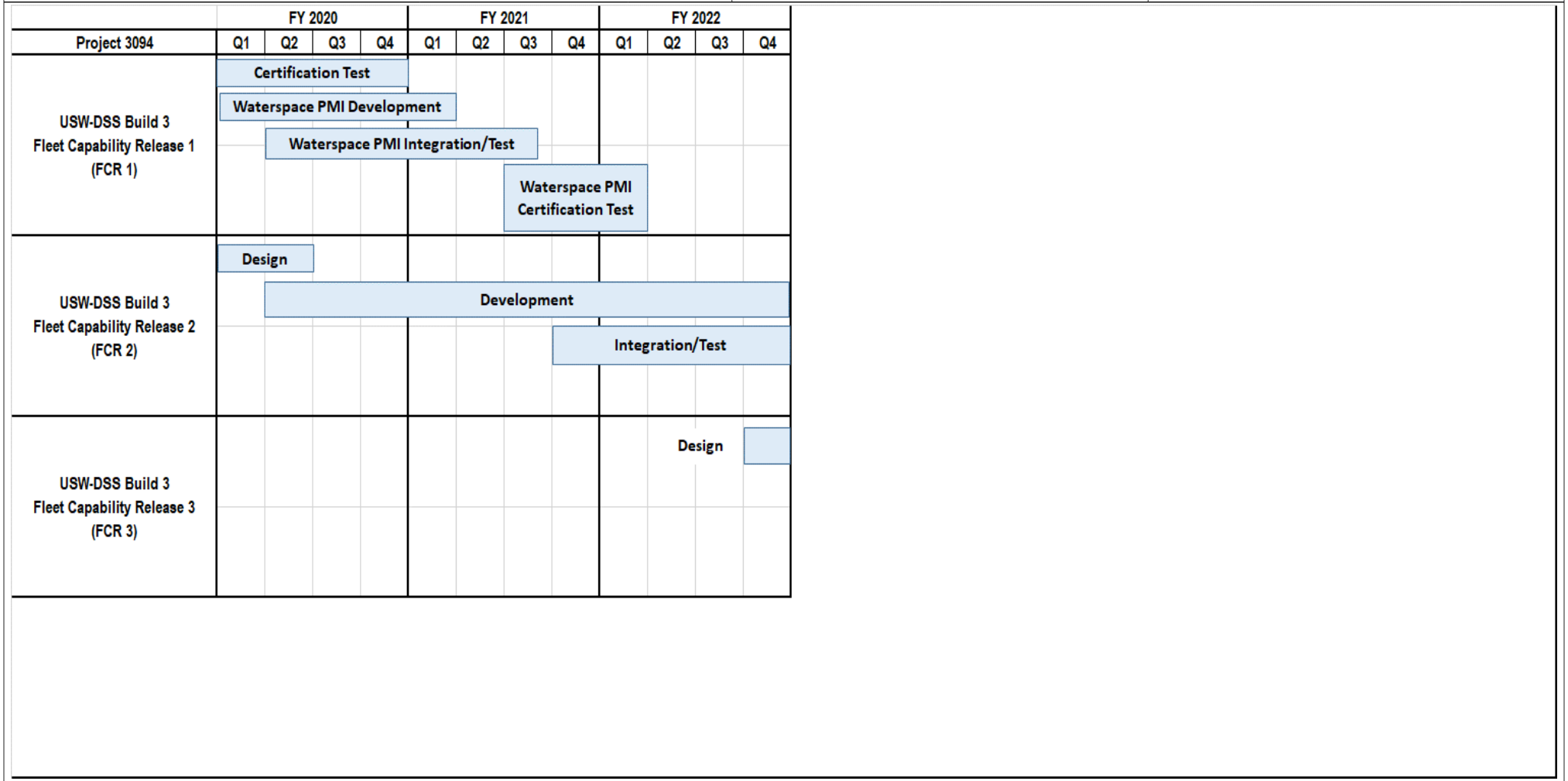

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3094				
USW-DSS Build 3 Fleet Capability Release 1 (FCR 1): Certification Test	1	2020	4	2020
USW-DSS Build 3 Fleet Capability Release 1 (FCR 1): Waterspace PMI Development	1	2020	1	2021
USW-DSS Build 3 Fleet Capability Release 1 (FCR 1): Waterspace PMI Integration/ Test	2	2020	3	2021
USW-DSS Build 3 Fleet Capability Release 1 (FCR 1): Waterspace PMI Certification Test	3	2021	1	2022
USW-DSS Build 3 Fleet Capability Release 2 (FCR 2): Design	1	2020	2	2020
USW-DSS Build 3 Fleet Capability Release 2 (FCR 2): Development	2	2020	4	2022
USW-DSS Build 3 Fleet Capability Release 2 (FCR 2): Integration/Test	4	2021	4	2022
USW-DSS Build 3 Fleet Capability Release 3 (FCR 3): Design	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
3439: *Project NAUTICA: Integrated Theater ASW C4I*	9.800	7.206	2.382	1.433	-	1.433	-	-	-	-	-	-
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 2022 continues the effort required to 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: NAUTICA - Theater Architecture Development and System Integration	7.206	2.382	1.433	0.000	1.433
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					

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 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 2021 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 between different classification and foreign-releasability levels. - Develop the system artifacts required for data exchange between systems to support blue force management such as incorporation of Waterspace Prevention of Mutual Interference (PMI) tools. - Continue the requirements assessment for an expanded enterprise cloud-computing environment for TASW. ***FY 2022 Base Plans:*** - Continue TASW Phase II High Side Sensor Fusion requirements definition and systems engineering efforts - Update MBSE analysis and track progress of 399 multi-system requirements addressed by twenty-three (23) programs of record across three (3) system commands. - Orchestrate collaboration for multi-program development effort and develop solutions for seam issues between platforms and networks. - Continue development and modernization of DoD Government cloud environment for Theater USW capability testing and analysis. ***FY 2022 OCO Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
The FY 2021 ($2.382M) to FY 2022 ($1.433M) decrease ($-0.949M) reflects the completion of NAUTICA Phase I development and rapid prototyping efforts.					
Accomplishments/Planned Programs Subtotals	7.206	2.382	1.433	0.000	1.433

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 2022 Navy		Date: May 2021
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*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Adaptive Methods : VA	0.850	0.638	Jan 2020	0.262	Dec 2020	0.200	Dec 2021	-		0.200	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	COMNAVAIRPAC : CA	0.210	0.158	Jan 2020	0.070	Nov 2020	0.000		-		0.000	-	-	-
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	DH Wagner : PA	0.100	0.075	Jan 2020	0.033	Dec 2020	0.035	Dec 2021	-		0.035	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Carderock : MD	0.750	0.563	Jan 2020	0.249	Nov 2020	0.216	Nov 2021	-		0.216	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Dahlgren : VA	0.445	0.334	Jan 2020	0.148	Nov 2020	0.075	Nov 2021	-		0.075	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Keyport : WA	1.273	0.955	Nov 2019	0.212	Nov 2020	0.200	Nov 2021	-		0.200	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Newport : RI	0.888	0.666	Dec 2019	0.150	Nov 2020	0.100	Nov 2021	-		0.100	-	-	-
NAUTICA - Theater Architecture Development and System Integration	WR	NIWC : CA	0.280	0.210	Nov 2019	0.093	Dec 2020	0.095	Nov 2021	-		0.095	-	-	-
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	UT/ARL : TX	1.774	1.331	Jan 2020	0.295	Dec 2020	0.125	Dec 2021	-		0.125	-	-	-
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Various : Var*	2.190	1.205	Dec 2019	0.529	Feb 2021	0.067	Dec 2021	-		0.067	-	-	-
		Subtotal	8.760	6.135		2.041		1.113		-		1.113	-	-	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 2022 Navy		Date: May 2021
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*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.095	0.097	Jan 2020	0.000		0.000		-		0.000	-	-	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.000	0.000		0.080	Dec 2020	0.075	Dec 2021	-		0.075	-	-	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal* : VA	0.915	0.944	Jan 2020	0.000		0.000		-		0.000	-	-	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.000	0.000		0.230	Dec 2020	0.220	Dec 2021	-		0.220	-	-	-
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.030	0.030	Jan 2020	0.031	Dec 2020	0.025	Oct 2021	-		0.025	-	-	-
		Subtotal	1.040	1.071		0.341		0.320		-		0.320	-	-	N/A

Remarks

*In addition to program office support, CGI Federal/KMS Solutions provide technical planning, systems engineering, and test support.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.800	7.206		2.382		1.433		-		1.433	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy		Date: May 2021
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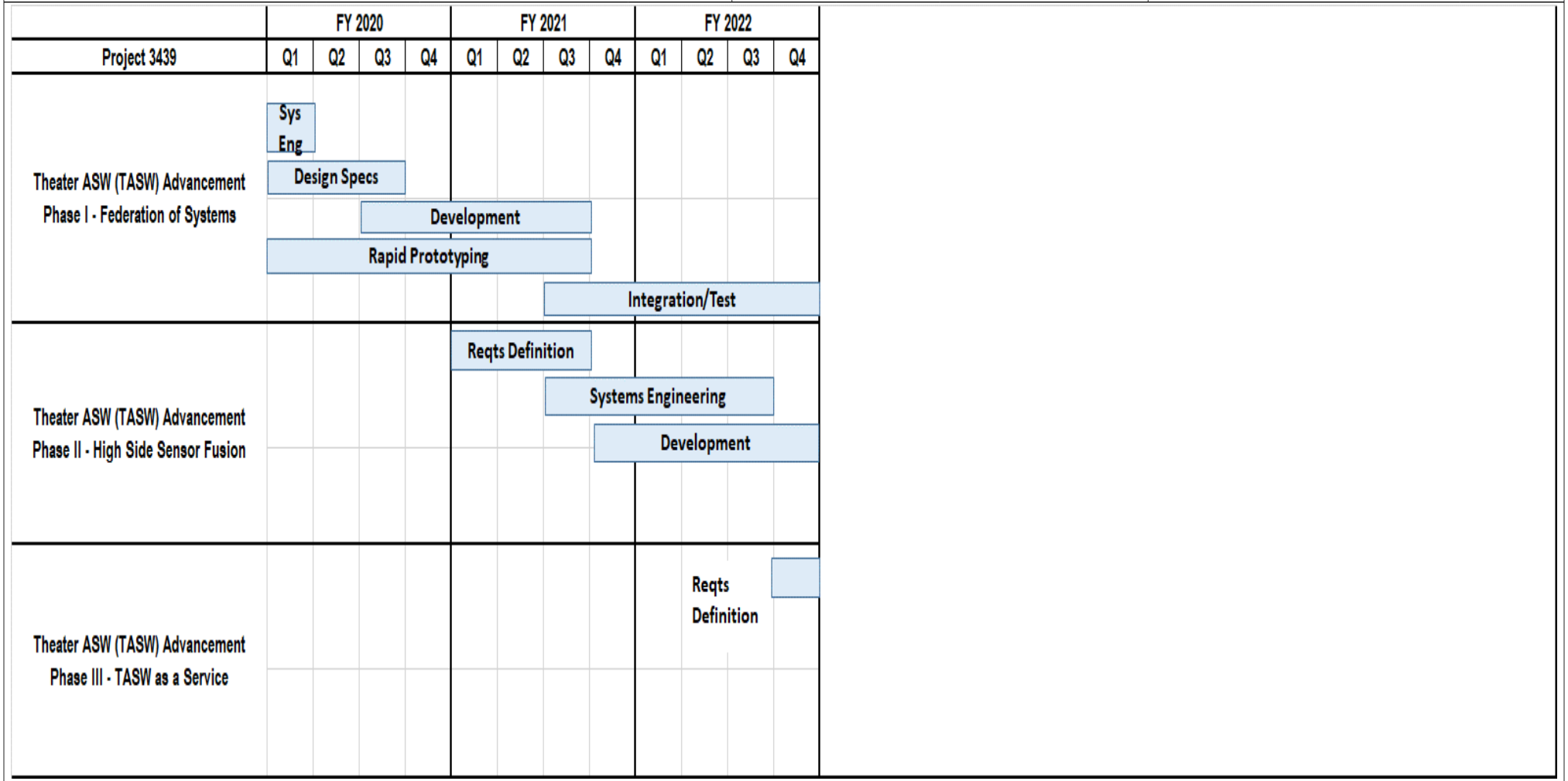

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3439				
Theater ASW (TASW) Advancement Phase I - Federation of Systems: Systems Engineering	1	2020	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	1	2020	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	4	2021	4	2022
Theater ASW (TASW) Phase III - TASW as a Service: Requirements Definition	4	2022	4	2022