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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	106.103	11.389	16.160	11.359	-	11.359	11.176	11.358	11.480	11.667	Continuing	Continuing
3094: <i>USW Decision Support</i>	86.775	9.994	9.913	10.484	-	10.484	10.389	10.574	10.709	10.910	Continuing	Continuing
3439: <i>Project NAUTICA: Integrated Theater ASW C4I</i>	19.328	1.395	1.247	0.875	-	0.875	0.787	0.784	0.771	0.757	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000

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. 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 has shifted to a Continuous Improvement / Continuous Deployment (CI/CD) model leveraging multiple Development and Secure cloud Operational environments (DevSecOps) which will produce baseline software upgrades twice annually. Within this CI/CD process, this project will develop, design, integrate, and test additional tools/capabilities for USW-DSS Build 3 including, but not limited to: Waterspace Management (WSM) and 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 Theater ASW (TASW) capabilities, Data-Focused Navy Tactical Cloud Integration, and virtualization of the electronic Master Tactical Plot (eMTP) visualization/display service as 'Web USW-DSS' 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).

Future USW-DSS Build 3 Fleet Capability Releases (FCR) will focus on required system re-architecture to keep pace with the latest network and system hardware obsolescence as well as expanded processing and user interface capacity requirements that are driven by expanded multi-system and multi-level security inputs. These FCRs will also achieve commonality between afloat and ashore USW-DSS systems, such that continuous development improvements impact both shipboard and Theater Undersea Warfare Command Headquarters (TUSWCHQ) watch floors, as well as training and Fleet support installations uniformly.

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 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

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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 Office (PEO) 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 to fuse Theater Undersea Warfare C2 data within USW-DSS and an ever increasing number of Command, Control, Communications, Computers & Intelligence (C4I) tactical data sources into a CTP.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	11.631	11.160	11.105	-	11.105
Current President's Budget	11.389	16.160	11.359	-	11.359
Total Adjustments	-0.242	5.000	0.254	-	0.254
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.242	0.000			
• Program Adjustments	0.000	0.000	-0.008	-	-0.008
• Rate/Misc Adjustments	0.000	0.000	0.262	-	0.262

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Theater edge correlation and distribution system*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	0.000	5.000
	0.000	5.000
	0.000	5.000

Change Summary Explanation

FUNDING CHANGES AT THE OVERALL PE LEVEL:

- FY 2023 increase of \$+5.000M supports the Theater Edge Correlation and Distribution System effort in Project C889.
- FY 2024 net increase of \$+0.254M reflects the incorporation of miscellaneous program/rate adjustments.

FY 2023 TO FY 2024 INCREASE/DECREASE:

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<p>- PROJECT 3094: The FY 2023 to FY 2024 increase (\$+0.571M) is required for the development and integration of USW-DSS technologies to support tactical dissemination of USW tactical picture and targeting data to the submarine.</p> <p>- PROJECT 3439: The FY 2023 to FY 2024 decrease (\$-0.372M) is in alignment with current program phasing.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3094 / <i>USW Decision Support</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3094: <i>USW Decision Support</i>	86.775	9.994	9.913	10.484	-	10.484	10.389	10.574	10.709	10.910	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 Anti-Submarine Warfare (ASW) Command and Control (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 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 ensures safe operational and tactical C2 of submerged U.S. and allied submarines via Prevention of Mutual Interference (PMI) capability, and protects from blue-on-blue engagement with a Waterspace Management planning and execution tool. 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-89A(V)15 Surface Ship ASW Combat System, the Global Command and Control System - Maritime (GCCS-M), and the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC). USW-DSS processes this and other tactical data and supports intelligent dissemination of the data to unit 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 Fleet Capability Release (FCR) process. USW-DSS Build 3 FCR incremental developments 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 provides 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 project provides 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-89A(V)15 Surface Ship ASW Combat System, AN/SQQ-34 CV-TSC, 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

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operations across different security enclaves and additional platform tactical data interfaces such as those associated with P-8A Poseidon aircraft, and submarines. Additionally, USW-DSS is adopting agile Information Technology (IT) developments to align with the Compile to Combat in 24 Hours (C2C24) initiative.

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 Management and 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, Area Planning, improved TASW capabilities, Data-Focused Navy Tactical Cloud Integration, and virtualization of the electronic Master Tactical Plot (eMTP) visualization/display service as 'Web USW-DSS' 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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Title: USW-DSS Capability Improvements</p> <p align="right">Articles:</p> <p>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 virtualization of the Electronic Master Tactical Plot (eMTP) visualization/display service as 'Web USW-DSS', and cyber security protection requirements.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue USW-DSS Build 3 Fleet Capability Release (FCR) 2 integration/test efforts to include the development and delivery of two additional capability drops to improve TUSW command and control (C2) capability. - Improve system reliability, maintainability, and resilience of USW-DSS Build 3 by integrating A/B system concept into system architecture through virtualization and increased capacity. - Integrate USW-DSS Build 3 FCR 2 into Consolidated Afloat Network and Enterprises System (CANES) for afloat systems by successfully completing CANES application integration testing. - Continue development and transition of Adaptive Anti-Submarine Warfare (AASW) improved submarine search and sensor analysis toolsets. - Improve Continuous Integration, Continuous Delivery (CI/CD), and software development processes for USW-DSS Build 3 via agile integration and rapid delivery through development, security, and operations (DevSecOps). 	9.994	9.913	10.484	0.000	10.484
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue to develop and test interfaces with the AN/SQQ-89A(V)15 Surface ASW Combat System. - Continue to support USW-DSS allied/coalition interoperability requirements. <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none"> - Complete USW-DSS Build 3 FCR 2 integration/test efforts. - Complete certification of USW-DSS Build 3 FCR 2 for use on afloat systems. - Complete development and testing of interfaces to the AN/SQQ-89A(V)15 Surface ASW Combat System. - Continue to support USW-DSS allied/coalition interoperability requirements to include testing of interoperability between US and allied USW-DSS systems. - Continue to improve CI/CD, and software development processes for USW-DSS Build 3 via agile integration and rapid delivery through DevSecOps. - Continue development and transition of AASW improved submarine search and sensor analysis toolsets. <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> - FY 2023 (\$9.913M) to FY 2024 (\$10.484M) increase (\$+0.571M) is required for the development and integration of USW-DSS technologies to support tactical dissemination of USW tactical picture and targeting data to the submarine. 					
Accomplishments/Planned Programs Subtotals	9.994	9.913	10.484	0.000	10.484

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/2176: <i>USW Support Equipment (N2N6/USW-DSS only)</i>	8.668	12.216	12.264	-	12.264	12.526	12.834	13.084	13.368	Continuing	Continuing

Remarks

D. Acquisition Strategy
<ul style="list-style-type: none"> - 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. - Utilize Other Transaction Authority (OTA) to expedite prototype development.

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
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- 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.
- Pursue future software-only architecture through virtualization and DevSecOps to allow for rapid system upgrades and cybersecurity accreditation.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Capability Enhancements - Development	C/CPFF	Adaptive Methods : VA	7.996	1.250	Mar 2022	1.240	Dec 2022	0.500	Dec 2023	-		0.500	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	C/CPFF	DH Wagner : PA	1.208	0.375	Mar 2022	0.370	Dec 2022	0.760	Dec 2023	-		0.760	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NIWC/Pacific : CA	1.200	1.500	Jan 2022	1.450	Dec 2022	1.450	Nov 2023	-		1.450	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NSWC/Carderock : MD	4.883	0.500	Mar 2022	0.475	Nov 2022	0.300	Nov 2023	-		0.300	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	3.554	0.550	Oct 2021	0.500	Nov 2022	1.000	Oct 2023	-		1.000	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	WR	NUWC/Newport : RI	5.338	3.400	Oct 2021	3.145	Nov 2022	2.349	Oct 2023	-		2.349	Continuing	Continuing	Continuing
USW-DSS Capability Enhancements - Development	C/CPFF	Progeny : VA	6.630	0.600	Nov 2021	0.580	Dec 2022	1.850	Dec 2023	-		1.850	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*	51.810	1.389	Mar 2022	1.663	Dec 2022	1.785	Dec 2023	-		1.785	Continuing	Continuing	Continuing
Subtotal			83.035	9.564		9.423		9.994		-		9.994	Continuing	Continuing	N/A

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

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation (DT&E)	C/CPFF	Adaptive Methods : VA	0.972	0.115	Mar 2022	0.115	Dec 2022	0.115	Dec 2023	-		0.115	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	Progeny : VA	1.897	0.150	Nov 2021	0.150	Dec 2022	0.150	Dec 2023	-		0.150	Continuing	Continuing	Continuing
Subtotal			2.869	0.265		0.265		0.265		-		0.265	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.313	0.000		0.000		0.000		-		0.000	0.000	0.313	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.088	0.090	Mar 2022	0.100	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	0.368	0.000		0.000		0.000		-		0.000	0.000	0.368	-
Program Management Support - Sytems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.042	0.050	Feb 2022	0.100	Dec 2022	0.100	Jan 2024	-		0.100	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.060	0.025	Oct 2021	0.025	Oct 2022	0.025	Oct 2023	-		0.025	Continuing	Continuing	Continuing
Subtotal			0.871	0.165		0.225		0.225		-		0.225	Continuing	Continuing	N/A

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

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

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Project 3094	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
USW-DSS Build 3 Fleet Capability Release Design/Development Pipeline	USW-DSS FCR Continuous Improvement Design/Development																															
USW-DSS Build 3 Fleet Capability Release 1 (FCR 1)	Waterspace PMI Certification Test																															
USW-DSS Build 3 Fleet Capability Release 2 (FCR 2)					Integration/Test								Certification Test																			
USW-DSS Build 3 Fleet Capability Release 3 (FCR 3)													Integration/Test								Certification Test											
USW-DSS Build 3 Fleet Capability Release 4 (FCR 4)																									Integration/Test							

Notes:

- The Certification Test period will evaluate the operational effectiveness of each FCR and inform/influence the design/development of the next FCR.
- During the Integration/Test period, each FCR prototype developed in the DEVSECOPS environment will be matured, capabilities will be added, and software bugs will be fixed. Up to four (4) capability drop deliveries will be incrementally tested and delivered to the Fleet providing improved USW/ASW toolsets to the theater.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>USW-DSS Build 3 Fleet Capability Release (FCR)</i>				
Continuous Improvement Design/Development	1	2022	4	2028
<i>USW-DSS Build 3 Fleet Capability Release 1 (FCR 1)</i>				
Waterspace Management and PMI Certification Test	1	2022	4	2022
<i>USW-DSS Build 3 Fleet Capability Release 2 (FCR 2)</i>				
Integration/Test	4	2022	3	2024
Certification Test	3	2024	4	2024
<i>USW-DSS Build 3 Fleet Capability Release 3 (FCR 3)</i>				
Integration/Test	4	2024	1	2027
Certification Test	1	2027	2	2027
<i>USW-DSS Build 3 Fleet Capability Release 4 (FCR 4)</i>				
Integration/Test	2	2027	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>				Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3439: <i>Project NAUTICA: Integrated Theater ASW C4I</i>	19.328	1.395	1.247	0.875	-	0.875	0.787	0.784	0.771	0.757	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 - Counter Undersea (N2CX) 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 decomposes 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), Battlespace Management Tactical Decision Aid (BAM TDA), and other Future Naval Capabilities (FNCs) that will start to transition Technology Readiness Level (TRL) 5/6 enabling technologies into the USW-DSS Program of Record.

FY 2024 continues the effort required to deliver an integrated TASW battle management suite. NAUTICA investments are prioritized 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 Prevention of Mutual Interference (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 Office (PEO) for Integrated Warfare Systems (IWS), PEO Command, Controls, Communications, Computers and intelligence (C4I), PEO AIR, PEO Undersea Warfare Systems (UWS), 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 to exchange, display, and exploit information at the appropriate classifications.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: NAUTICA - Theater Architecture Development and System Integration	1.395	1.247	0.875	0.000	0.875
Articles:	-	-	-	-	-
Description: This project 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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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>developed under separate Programs of Record. Specifically, the Global Command and Control System - Maritime (GCCS-M), Undersea Warfare Decision Support System (USW-DSS), and Maritime Tactical Command & Control-2 (MTC-2) systems have evolved on separate timelines. This project 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-intensive 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). This investment will provide modeling and requirements development to support the Undersea Domain.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue Theater Anti-Submarine Warfare (TASW) Advancement Phase I Systems-of-Systems model and cybersecurity modeling efforts. - Complete systems engineering efforts for TASW Advancement Phase II High-Side Sensor Fusion systems engineering efforts. - Begin TASW Advancement Phase II High-Side Sensor Fusion development efforts. - Continue to orchestrate collaboration for multi-program development efforts and develop solutions for seams issues between platforms and networks. - Continue development and modernization of DoD Government cloud environment for Theater Undersea Warfare (TUSW) capability testing and analysis. - Manage Model-Based Systems Engineering (MBSE) living model addressing requirements across Programs of Record and projects. - Evaluate Science and Technology (S&T) developments to fill TUSW requirement gaps and recommend integration within TUSW programs of record. - Complete and deliver Cross Domain Solutions (CDS) update to meet DoD Raise the Bar (RTB) requirements and begin supporting USW-DSS Prevention of Mutual Interference (PMI) data flows. - Initiate development of methods for increasing TUSW Command and Control (C2) data exchange to submarines in emission controlled (EMCON) environments. <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none"> - Continue TASW Advancement Phase I Systems-of-Systems model and cybersecurity modeling efforts. - Continue TASW Advancement Phase II High-Side Sensor Fusion development efforts. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue to orchestrate collaboration for multi-program development efforts and develop solutions for seams issues between platforms and networks. - Continue managing MBSE living model addressing requirements across Programs of Record and projects. - Continue evaluating S&T developments to fill TUSW requirement gaps and recommend integration within TUSW Programs of Record. <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: - FY 2023 (\$1.247M) to FY 2024 (\$0.875M) decrease (\$-0.372M) is in alignment with current program phasing.</p>					
Accomplishments/Planned Programs Subtotals	1.395	1.247	0.875	0.000	0.875

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 addressing TUSW capability gaps for Water Space Management (WSM) and 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).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 5				PE 0604518N / Combat Information Center Conv				3439 / Project NAUTICA: Integrated Theater ASW C4I							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Adaptive Methods : VA	1.750	0.000		0.000		0.000		-		0.000	0.000	1.750	-
NAUTICA - Theater Architecture Development and System Integration	WR	COMNAVAIRPAC : CA	0.438	0.000		0.000		0.000		-		0.000	0.000	0.438	-
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	DH Wagner : PA	0.208	0.000		0.000		0.000		-		0.000	0.000	0.208	-
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Carderock : MD	1.562	0.000		0.000		0.000		-		0.000	0.000	1.562	-
NAUTICA - Theater Architecture Development and System Integration	WR	NSWC/Dahlgren : VA	0.927	0.075	Dec 2021	0.075	Nov 2022	0.000		-		0.000	0.000	1.077	-
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Keyport : WA	2.440	0.015	Nov 2021	0.050	Nov 2022	0.000		-		0.000	0.000	2.505	-
NAUTICA - Theater Architecture Development and System Integration	WR	NUWC/Newport : RI	1.704	0.025	Nov 2021	0.075	Nov 2022	0.000		-		0.000	0.000	1.804	-
NAUTICA - Theater Architecture Development and System Integration	WR	NIWC : CA	0.583	0.350	Nov 2021	0.300	Nov 2022	0.340	Nov 2023	-		0.340	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Progeny : VA	0.000	0.419	Feb 2022	0.269	Dec 2022	0.300	Dec 2023	-		0.300	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	UT/ARL : TX	3.400	0.280	Nov 2021	0.225	Dec 2022	0.050	Dec 2023	-		0.050	Continuing	Continuing	Continuing
NAUTICA - Theater Architecture Development and System Integration	C/CPFF	Various : Var*	3.864	0.031	Mar 2022	0.048	Dec 2022	0.050	Dec 2023	-		0.050	Continuing	Continuing	Continuing
Subtotal			16.876	1.195		1.042		0.740		-		0.740	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

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

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.192	0.000		0.000		0.000		-		0.000	0.000	0.192	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.080	0.075	Dec 2021	0.075	Dec 2022	0.050	Dec 2023	-		0.050	Continuing	Continuing	Continuing
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal* : VA	1.859	0.000		0.000		0.000		-		0.000	0.000	1.859	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.230	0.100	Dec 2021	0.105	Dec 2022	0.075	Dec 2023	-		0.075	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.091	0.025	Oct 2021	0.025	Oct 2022	0.010	Oct 2023	-		0.010	Continuing	Continuing	Continuing
Subtotal			2.452	0.200		0.205		0.135		-		0.135	Continuing	Continuing	N/A

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

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.328	1.395	1.247	0.875	-	0.875	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>
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Project 3439	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Theater ASW (TASW) Advancement Phase I - Federation of Systems	System-of-Systems Model / Cybersecurity Monitoring																											
Theater ASW (TASW) Advancement Phase II - High Side Sensor Fusion	Requirements Definition				Systems Engineering				Development				System-of-Systems Integration / Cybersecurity Updates															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 3439 / <i>Project NAUTICA: Integrated Theater ASW C4I</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Theater ASW (TASW) Advancement Phase I - Federation of Systems</i>				
System-of-Systems Model / Cybersecurity Monitoring	1	2022	4	2025
<i>Theater ASW (TASW) Advancement Phase II - High Side Sensor Fusion</i>				
Requirements Definition	1	2022	3	2022
Systems Engineering	1	2022	3	2023
Development	2	2023	4	2025
System-of-Systems Integration / Cybersecurity Updates	2	2025	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop and deploy Battle Management Aids at Theater Undersea Warfare Commander Headquarters.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
Congressional Add: Theater edge correlation and distribution system	0.000	5.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Develop and deploy Battle Management Aids at Theater Undersea Warfare Commander Headquarters supporting: - Aggregating, curating, and fusing an Undersea Warfare (USW) Common Tactical Picture (CTP) including targets, queuing, environmental, and Order of Battle data. - Broadcast builders providing customized and tailored CTP data over multiple Emission Control data links for tactical platforms. - Allied USW CTP dissemination and synchronization supporting multiple releasable CTP views supporting coalition and bi-lateral agreements.		
Congressional Adds Subtotals	0.000	5.000

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

N/A

Remarks

D. Acquisition Strategy

Utilize existing Naval Undersea Warfare Center (NUWC), Newport, RI contract with prime contractor SEACORP.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
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Proj 9999	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Theater Edge Correlation and Distribution System									Development																							
									Phase 1 Test/Cert ▲	Phase 1 Transition ▲	Phase 2 Test/Cert ▲	Phase 2 Transition ▲																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / <i>Combat Information Center Conv</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Theater Edge Correlation and Distribution System: Theater Edge Correlation and Distribution System Development	2	2023	3	2024
Theater Edge Correlation and Distribution System: Theater Edge Correlation and Distribution System Phase 1 Test & Certification	1	2024	1	2024
Theater Edge Correlation and Distribution System: Theater Edge Correlation and Distribution System Phase 1 Transition to USW-DSS	2	2024	2	2024
Theater Edge Correlation and Distribution System: Theater Edge Correlation and Distribution System Phase 2 Test & Certification	3	2024	3	2024
Theater Edge Correlation and Distribution System: Theater Edge Correlation and Distribution System Phase 2 Transition to USW-DSS	4	2024	4	2024