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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy **Date:** February 2018

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>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	49.280	6.092	8.062	19.303	-	19.303	17.217	13.163	11.321	11.550	Continuing	Continuing
3094: <i>USW Decision Support</i>	49.280	6.092	8.062	9.103	-	9.103	9.717	9.763	10.321	10.450	Continuing	Continuing
3439: <i>Project NAUTICA: Integrated Theater ASW C4I</i>	0.000	0.000	0.000	10.200	-	10.200	7.500	3.400	1.000	1.100	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by \$.086 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Project 3094: Prior year Undersea Warfare Decision Support System (USW-DSS) funding ended in FY 2013. This represents the restoration of USW-DSS development efforts, re-starting in FY 2017, for the modernization of Program of Record (PoR) Anti-Submarine Warfare (ASW) and Command & Control (C2) systems. Upgrades are required to address Cyber Security and End of Life (EOL) issues, improve capabilities, and in FY 2019 to implement Theater ASW (TASW) capability.

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). It 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 provides USW Commanders with an expanded, net-centric USW collaborative capability across Carrier Strike Group (CSG) platforms (CVNs, CG/DDGs, and Integrated Undersea Surveillance System (IUSS)) as well as supporting shore nodes to include Theater Surface Combatants (TSC), Training, Naval Oceanographic Processing Facility (NOPF), and Commander Task Force (CTF).

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/FRC 1 continues the development on the integrated, near-real time, net-centric ASW Common Tactical Picture (CTP) / Common Operational Picture (COP) on an electronic Master Tactical Plot (eMTP) for the TUSWC and critical shore command sites. Additionally, Build 3/FRC 1 will include efforts required to support analysis and trade studies to migrate USW-DSS to the cloud.

USW-DSS processing software is currently hosted on the Consolidated Afloat Networks and Enterprise Services (CANES) and implements a Service-Oriented Architecture (SOA). The current software version, Build 2 Release 3 (B2R3), will continue to field until the follow-on Build 3/FRC 2 (next release of afloat assets) is ready for Initial Operational Capability (IOC) certification in FY 2022.

Project 3439: Effective FY 2019, a new initiative titled Networked Architecture for Undersea Theater Integrated C2 Advantage (NAUTICA) is established for Theater Undersea Warfare (TUSW) architecture development, systems engineering, and design. Significantly, the new initiative integrates intelligence (operational and tactical)

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and sensor (national and organic) systems to provide a fully informed Common Operational Picture (COP) of enemy undersea forces, maximizing decision superiority and theater level planning, and address TUSW Command and Control (C2).						
The Navy plan for NAUTICA was approved by the June 2017 Flag Oversight Board and subsequently a roadmap was developed in FY 2018. Near term, FY 2019 accelerates development of the interfaces to federate existing "stove-piped" systems. FY 2019 funding will also accelerate the start of the system engineering required to develop and deliver an integrated TUSW capability In Accordance With (IAW) the 2007 ASW ICD. The plan prioritizes NAUTICA investments IAW the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017).						
FY 2019 funding federates existing systems by rapid prototyping of the designs and interfaces for existing legacy systems to be interoperable by FY 2020, and commences the accelerated design phase for a system of systems TUSW architecture to enable the existing programs of record under development from PWO IWS, PEO C4I, PEO AIR, and N9SP to deliver in the FYDP. Critical to this effort will be the development of the Cross Domain interface that will enable DCGS-N and USW-DSS to exchange and display information at the appropriate classifications.						
Funding under this project establishes the systems engineering activities required to accelerate development of TASW capabilities. It will establish a transition path for the Operational Planning Tool (OPT), Waterspace 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 DCGS-N Programs of Record (PORs).						
The funding will support TASW C2 experimentation at existing facilities for rapid innovation prototyping and provide a transition path for Phase II SBIR projects that will mature in the FY 2019/2020 timeframe.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		6.283	8.062	8.260	-	8.260
Current President's Budget		6.092	8.062	19.303	-	19.303
Total Adjustments		-0.191	0.000	11.043	-	11.043
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.191	0.000			
• Program Adjustments		0.000	0.000	11.314	-	11.314
• Rate/Misc Adjustments		0.000	0.000	-0.271	-	-0.271
Change Summary Explanation						
Funding:						

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<p>FY 2019: Increase of \$+10.2M to begin the development of the interfaces and systems required for the modernization of the TASW watchfloors. FY 2019 starts the rapid prototyping of high priority interfaces to allow the federation of key systems such as USW-DSS and Distributed Common Ground System - Navy (DCGS-N) and the development of multilevel security and or Cross-Domain Solutions that will enable Naval Architecture for Undersea Theater Integrated Command & Control Advantage (NAUTICA) capabilities. Additional \$1.0M begins trade studies and analysis of migrating USW-DSS to a cloud-based development environment.</p> <p>Schedule Changes from PB18 to PB19: The prolonged Continuing Resolution (new start in FY 2017) resulted in the delayed re-start of the USW-DSS Project. Efforts have shifted 1Q to the right, accordingly.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
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>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3094: <i>USW Decision Support</i>	49.280	6.092	8.062	9.103	-	9.103	9.717	9.763	10.321	10.450	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

USW-DSS B2R3 provides integrated, near-real time, net-centric ASW CTP/COP for the carrier strike groups (CSGs). USW-DSS is a C2 capability, identified in the ASW ICD, for the Sea Combat, TUSW, and ASW Commanders, and enables the ability to plan and conduct USW operations, alignment of sensors for exploitation of the environment, allocation of resources, optimization of operations and risk, and vulnerability assessment. USW-DSS provides USW Commanders with an expanded net-centric USW capability across CSG platforms (CVNs, CG/DDGs, and IUSS) as well as supporting shore nodes to include TSCs, Training, NOPF, and CTF.

USW-DSS shortens C2 decision processes for detection-to-engagement across multiple platforms, including those with low-bandwidth communications or intermittent connectivity. For at-sea nodes, USW-DSS software processing requirements are hosted on CANES and implement a SOA while display generation and operator interfaces are provided via USW-DSS hardware.

Starting in FY 2017, funding was restored to commence development of USW-DSS for TUSW (designated USW-DSS Build 3/FCR 1) and to re-architect B2R3 into a Modular Oriented System Architecture (MOSA), implement an electronic Master Tactical Plot (eMTP), modernize the interfaces and displays, and implement new mandated Cyber Security changes, across all afloat platforms and shore sites. Build 3 Fleet Capability Release (FCR) incremental developments will implement cost effective cyber security and TASW functionality by integrating inputs from data sources and platforms such as the P-8, provide improved and additional functionality, and improve stability/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/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 PORs that are significant data sources of information for USW-DSS. These include, but not limited to, the AN/SQQ-89 Surface ASW Combat System, the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC), Global Command and Control System - Maritime (GCCS-M), and the Distributed Common Ground System - Navy (DCGS-N). As the sensor capabilities mature they are incorporated as part of a future FCR.

USW-DSS Build 3 capability will a be phased evolutionary acquisition approach to provide cost-effective capability improvements to the warfighter. The current software version, B2R3 (development completed in FY 2013), will continue to field on afloat platforms until the follow-on Build 3/FCR 2 is certified for Fleet deployment.

In FY 2019, USW-DSS will continue to develop and test the software changes and perform the certification testing necessary to address EOL support issues that will impact B2R3.

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Additionally in FY 2019, funding will be used to develop, design, integrate, and test additional USW-DSS tools/capabilities for B3 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 incorporate the eMTP visualization/display service on which to render the CTP/COP.							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: USW-DSS Capability Improvements			6.092	8.062	9.103	0.000	9.103
Articles:			-	-	-	-	-
Description: Design, develop, integrate, and test additional USW-DSS tools/capabilities for Build 3 including 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 TUSW capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporate the eMTP visualization/display service.							
FY 2018 Plans:							
- Complete systems engineering efforts on Build 3/FCR 1 to finalize the RDP through formal approval by the Requirements Governance Board (RGB).							
- Continue development activities on Build 3/FCR 1 to include required acquisition artifacts and technical system design documentation.							
- Conduct formal System Engineering Technical Reviews (SETR) to assess the technical and programmatic maturity of the development efforts to include a Systems Requirements/Functional Review (SRR/SFR), Preliminary Design Review (PDR), and Critical Design Review (CDR).							
- Complete interface specifications and draft Interface Control Drawings (ICDs) in preparation for prototype delivery to CTF 34 TASW watchfloor for Composite Training Unit Exercise (COMPTUEX) at-sea event scheduled for 3Q 2018.							
FY 2019 Base Plans:							
- Begin systems engineering bottoms-up product realization for USW-DSS Build 3/FCR 1.							
- Conduct formal System Engineering Technical Reviews (SETR) to assess the technical and programmatic maturity of the development efforts to include Software Incremental Reviews (SWIR) and Test Readiness Reviews (TRR), working towards an Element Certification Review (ECR) in FY 2020, ahead of formal fielding of Build 3/FCR 1.							
- Complete plans supporting early introduction of Build 3/FCR 1 capability through a series of capability drops.							
- Develop the Cyber Security strategy for USW-DSS Build 3.							

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) - Begin up-front systems engineering activities on Build/FCR 2, including development of an Build 3/FCR 2 RDP. - Begin analysis and trade studies for the migration of USW-DSS Build 3 FCR-1 to a cloud-based development environment. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: The FY19 increase of is required to enable analysis and trade studies to migrate USW-DSS to a cloud-based development environment.	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Accomplishments/Planned Programs Subtotals	6.092	8.062	9.103	0.000	9.103

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/2176: <i>USW Support Equipment (N2N6/USW-DSS only)</i>	7.163	13.653	10.134	-	10.134	9.008	10.339	11.854	14.999	Continuing	Continuing
Remarks											

D. Acquisition Strategy
- Hardware/Software development and integration via Navy Warfare Centers and Small Business contractors. - Utilize SBIR funding and development efforts for open competition on capability improvements to reach TRL 5/6. - Invest POR funding into maturing SBIR developed technologies beyond TRL 5/6 for integration into USW-DSS and TASW systems via Phase III funding.

E. Performance Metrics
- Deliver incremental FCRs with capabilities in high interest areas that impact Fleet metrics, such as Detect to Engage (DTE) and Fleet readiness.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
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)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 H/W & S/W Development	C/CPFF	Adaptive Methods : VA	0.000	1.592	Jul 2017	1.129	Dec 2017	1.380	Dec 2018	-		1.380	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	DH Wagner : PA	0.000	0.000		0.350	Feb 2018	0.400	Dec 2018	-		0.400	0.000	0.750	-
UISW-DSS H/W & S/W Development	WR	NSWC/Carderock : MD	0.000	0.800	Jul 2017	1.000	Oct 2017	1.175	Nov 2018	-		1.175	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	WR	NSWC/Dahlgren : VA	0.000	0.000		0.250	Jan 2018	0.300	Nov 2018	-		0.300	0.000	0.550	-
USW-DSS H/W & S/W Development	WR	NUWC/Keyport : WA	0.000	0.300	Jul 2017	0.500	Oct 2017	0.570	Nov 2018	-		0.570	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	WR	NUWC/Newport : RI	0.000	0.510	Jul 2017	0.940	Oct 2017	1.045	Nov 2018	-		1.045	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	Progeny : VA	0.000	1.340	Aug 2017	2.100	Jan 2018	2.295	Dec 2018	-		2.295	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	UT/ARL : TX	0.000	0.000		0.175	Dec 2017	0.275	Dec 2018	-		0.275	0.000	0.450	-
Total Prior Year Costs	Various	Var : Var	49.280	0.000		0.000		0.000		-		0.000	0.000	49.280	-
Subtotal			49.280	4.542		6.444		7.440		-		7.440	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Integration and Test	C/CPFF	Adaptive Methods : VA	0.000	0.250	Jul 2017	0.550	Dec 2017	0.555	Dec 2018	-		0.555	Continuing	Continuing	Continuing
USW-DSS Integration and Test	C/CPFF	Progeny : VA	0.000	1.000	Aug 2017	0.750	Jan 2018	0.790	Dec 2018	-		0.790	Continuing	Continuing	Continuing
Subtotal			0.000	1.250		1.300		1.345		-		1.345	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
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)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Program Management Support	C/CPFF	CACI : VA	0.000	0.100	Aug 2017	0.118	Jan 2018	0.118	Dec 2018	-		0.118	Continuing	Continuing	Continuing
USW-DSS Program Management Support	C/CPFF	CGI Federal : VA	0.000	0.200	Aug 2017	0.200	Nov 2017	0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
Subtotal			0.000	0.300		0.318		0.318		-		0.318	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			49.280	6.092		8.062		9.103		-		9.103	Continuing	Continuing	N/A
Remarks															

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PE 0604518N: *Combat Information Center Conv*
Navy

R-1 Line #136

Project (Number/Name)	Start Date	End Date	Duration (Days)	Actual Cost	Budgeted Cost	Variance	Cost Index	Performance Index	Cost Variance	Cost Performance Index	Cost Variance at Completion	Cost Performance Index at Completion
1	1/1/2020	1/31/2020	31	10000	10000	0	1.00	1.00	0	1.00	0	1.00
2	2/1/2020	2/28/2020	28	15000	15000	0	1.00	1.00	0	1.00	0	1.00
3	3/1/2020	3/31/2020	31	20000	20000	0	1.00	1.00	0	1.00	0	1.00
4	4/1/2020	4/30/2020	30	25000	25000	0	1.00	1.00	0	1.00	0	1.00
5	5/1/2020	5/31/2020	31	30000	30000	0	1.00	1.00	0	1.00	0	1.00
6	6/1/2020	6/30/2020	30	35000	35000	0	1.00	1.00	0	1.00	0	1.00
7	7/1/2020	7/31/2020	31	40000	40000	0	1.00	1.00	0	1.00	0	1.00
8	8/1/2020	8/31/2020	31	45000	45000	0	1.00	1.00	0	1.00	0	1.00
9	9/1/2020	9/30/2020	30	50000	50000	0	1.00	1.00	0	1.00	0	1.00
10	10/1/2020	10/31/2020	31	55000	55000	0	1.00	1.00	0	1.00	0	1.00
11	11/1/2020	11/30/2020	30	60000	60000	0	1.00	1.00	0	1.00	0	1.00
12	12/1/2020	12/31/2020	31	65000	65000	0	1.00	1.00	0	1.00	0	1.00
13	1/1/2021	1/31/2021	31	70000	70000	0	1.00	1.00	0	1.00	0	1.00
14	2/1/2021	2/28/2021	28	75000	75000	0	1.00	1.00	0	1.00	0	1.00
15	3/1/2021	3/31/2021	31	80000	80000	0	1.00	1.00	0	1.00	0	1.00
16	4/1/2021	4/30/2021	30	85000	85000	0	1.00	1.00	0	1.00	0	1.00
17	5/1/2021	5/31/2021	31	90000	90000	0	1.00	1.00	0	1.00	0	1.00
18	6/1/2021	6/30/2021	30	95000	95000	0	1.00	1.00	0	1.00	0	1.00
19	7/1/2021	7/31/2021	31	100000	100000	0	1.00	1.00	0	1.00	0	1.00
20	8/1/2021	8/31/2021	31	105000	105000	0	1.00	1.00	0	1.00	0	1.00
21	9/1/2021	9/30/2021	30	110000	110000	0	1.00	1.00	0	1.00	0	1.00
22	10/1/2021	10/31/2021	31	115000	115000	0	1.00	1.00	0	1.00	0	1.00
23	11/1/2021	11/30/2021	30	120000	120000	0	1.00	1.00	0	1.00	0	1.00
24	12/1/2021	12/31/2021	31	125000	125000	0	1.00	1.00	0	1.00	0	1.00
25	1/1/2022	1/31/2022	31	130000	130000	0	1.00	1.00	0	1.00	0	1.00
26	2/1/2022	2/28/2022	28	135000	135000	0	1.00	1.00	0	1.00	0	1.00
27	3/1/2022	3/31/2022	31	140000	140000	0	1.00	1.00	0	1.00	0	1.00
28	4/1/2022	4/30/2022	30	145000	145000	0	1.00	1.00	0	1.00	0	1.00
29	5/1/2022	5/31/2022	31	150000	150000	0	1.00	1.00	0	1.00	0	1.00
30	6/1/											

PE 0604518N / Combat Information Center
Conv

3094 / USW Decision Support



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
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>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 3094</i>				
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Design / Development: FCR 1 Design	4	2017	2	2018
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Design / Development: FCR 1 Development	1	2018	2	2019
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 Integration & Test	1	2018	4	2019
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 COMPTUEX At-Sea Test	3	2018	3	2018
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 Certification Test	4	2019	2	2020
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Design / Development: FCR 2 Design	3	2019	2	2020
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Design / Development: FCR 2 Development	2	2020	3	2021
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Integration / Test Events: FCR 2 Integration & Test	1	2021	2	2022
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Integration / Test Events: FCR 2 Certification Test	2	2022	4	2022
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Design / Development: FCR 3 Design	4	2021	3	2022
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Design / Development: FCR 3 Development	3	2022	4	2023
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Integration / Test Events: FCR 3 Integration & Test	4	2023	4	2023

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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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3439: <i>Project NAUTICA: Integrated Theater ASW C4I</i>	0.000	0.000	0.000	10.200	-	10.200	7.500	3.400	1.000	1.100	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Effective FY 2019, a new initiative titled NAUTICA is established for TUSW architecture development, systems engineering, and design (+\$10.2M). Significantly, the new initiative integrates intelligence (operational and tactical) and sensor (national and organic) systems to provide a fully informed COP of enemy undersea forces, maximizing decision superiority and theater level planning, and address TUSW C2.

The Navy plan for NAUTICA was approved by the June 2017 Flag Oversight Board and subsequently a roadmap was developed in FY 2018. Near term, FY 2019 accelerates development of the interfaces to federate existing "stove piped" systems. FY 2019 funding will also accelerate (from outside the FYDP) the start of the system engineering required to develop and deliver an integrated TUSW capability In Accordance With (IAW) the 2007 ASW ICD. The plan prioritizes NAUTICA investments IAW the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" Letter (24 February 2017).

FY 2019 funding federates existing systems by rapid prototyping of the designs and interfaces for existing legacy systems to be interoperable by FY 2020, and commences the accelerated design phase for a system of systems TUSW architecture to enable the existing programs of record under development from PWO IWS, PEO C4I, PEO AIR, and N9SP to deliver in the FYDP. Critical to this effort will be the development of the Cross Domain interface that will enable DCGS-N and USW-DSS to exchange and display information at the appropriate classifications.

Funding under this project establishes the systems engineering activities required to accelerate development of TASW capabilities. It will establish a transition path for the Operational Planning Tool (OPT), Waterspace Planner (WASP), Battle Management TDA, and other FNCs that will start to transition TRL 5/6 enabling technologies into the USW-DSS and DCGSN PORs.

The funding will support TASW C2 experimentation at existing facilities for rapid innovation prototyping and provide a transition path for Phase II SBIR projects that will mature in the FY 2019/2020 timeframe.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NAUTICA - Theater Architecture Development and System Integration	0.000	0.000	10.200	0.000	10.200
Articles:	-	-	-	-	-
Description: FY 2019 initiates the analysis of the TASW Command Center system of systems design and planning. The effort will make specific recommendations for the design and development of the interfaces and					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018			
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		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
test procedures for the systems being developed under separate Programs of Record. Specifically, the GCCS-M, USW DSS, DCGS-N, MTC-2 systems have evolved on separate timelines. The funding will develop near term solutions and propose a long range plan for the systems. The investment will, as a first step, 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 C2 needs identified in the ASW ICD. FY 2018 Plans: N/A FY 2019 Base Plans: - Complete Systems Engineering Top-Down Design for NAUTICA. - Complete requirements definition, requirements analysis, and architecture design. - Develop Requirements Definition Package (RDP). - Develop and approve Systems Engineering Plan (SEP) in accordance with the Defense Acquisition Guidebook (DAG). - Develop plan to migrate to Navy Tactical Cloud environment. - Commence the systems engineering for the transition of Office of Naval Research (ONR) Future Naval Capabilities (FNCs) for Waterspace Management, and Battlespace Awareness Tactical Decision Aids (TDA). - Utilize TASW Tactical Advancements for the Next Generation (TANG) recommendations for CASEBOOK and develop prototypes for evaluation by the Fleet. - Develop interface specifications between systems to support Fleet exercises for early incorporation of P-8 data onto the TASW Command Center. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: FY19 is the first year of Project 3439 NAUTICA Integrated Theater ASW C4I.						
Accomplishments/Planned Programs Subtotals		0.000	0.000	10.200	0.000	10.200

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018	
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			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
• OPN/2176: USW Support Equipment (N2N6/USW-DSS only)	4.463	10.784	7.305	-	7.305	6.058	7.322	8.777	11.852	0.000	97.113
Remarks											
D. Acquisition Strategy											
<ul style="list-style-type: none"> - New Theater Architecture Development and System Integration initiative provides the transition funding for the ONR FNC investments, for Water Space Management and including Battlespace Management TDA. - Capabilities developed under SBIRs and FNCs are incorporated into TASW PoRs, such as USW-DSS, through incremental FCRs. 											
E. Performance Metrics											
<ul style="list-style-type: none"> - Measure system performance and improvement through System Qualification Testing (SQT) and evaluate the fielded system performance against approved TASW metrics derived from Systems Engineering efforts. 											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
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>					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
TASW Development/Engineering	C/CPFF	Adaptive Methods : VA	0.000	0.000		0.000		1.825	Dec 2018	-		1.825	Continuing	Continuing	Continuing
TASW Development/Engineering	MIPR	ADFC : CO	0.000	0.000		0.000		0.720	Dec 2018	-		0.720	Continuing	Continuing	Continuing
TASW Development/Engineering	C/CPFF	JHU/APL : MD	0.000	0.000		0.000		0.425	Jan 2019	-		0.425	Continuing	Continuing	Continuing
TASW Development/Engineering	MIPR	MITRE : VA	0.000	0.000		0.000		0.525	Dec 2018	-		0.525	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NSA Monterey : CA	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NAWC/Pax River : MD	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NSWC/Carderock : MD	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NSWC/Dahlgren : VA	0.000	0.000		0.000		0.600	Nov 2018	-		0.600	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NUWC/Keyport : WA	0.000	0.000		0.000		0.540	Nov 2018	-		0.540	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	NUWC/Newport : RI	0.000	0.000		0.000		0.465	Nov 2018	-		0.465	Continuing	Continuing	Continuing
TASW Development/Engineering	C/CPFF	Progeny : VA	0.000	0.000		0.000		1.350	Dec 2018	-		1.350	Continuing	Continuing	Continuing
TASW Development/Engineering	C/CPFF	SPA : VA	0.000	0.000		0.000		0.425	Dec 2018	-		0.425	Continuing	Continuing	Continuing
TASW Development/Engineering	WR	SPAWAR : CA	0.000	0.000		0.000		0.890	Nov 2018	-		0.890	Continuing	Continuing	Continuing
TASW Development/Engineering	C/CPFF	UT/ARL : TX	0.000	0.000		0.000		0.560	Dec 2018	-		0.560	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		9.525		-		9.525	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
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)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
TASW Program Management Support	C/CPFF	CACI : VA	0.000	0.000		0.000		0.450	Dec 2018	-		0.450	Continuing	Continuing	Continuing
TASW Program Management Support	C/CPFF	CGI Federal : VA	0.000	0.000		0.000		0.225	Dec 2018	-		0.225	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		0.675		-		0.675	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		0.000		10.200		-		10.200	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy

Date: February 2018

Appropriation/Budget Activity

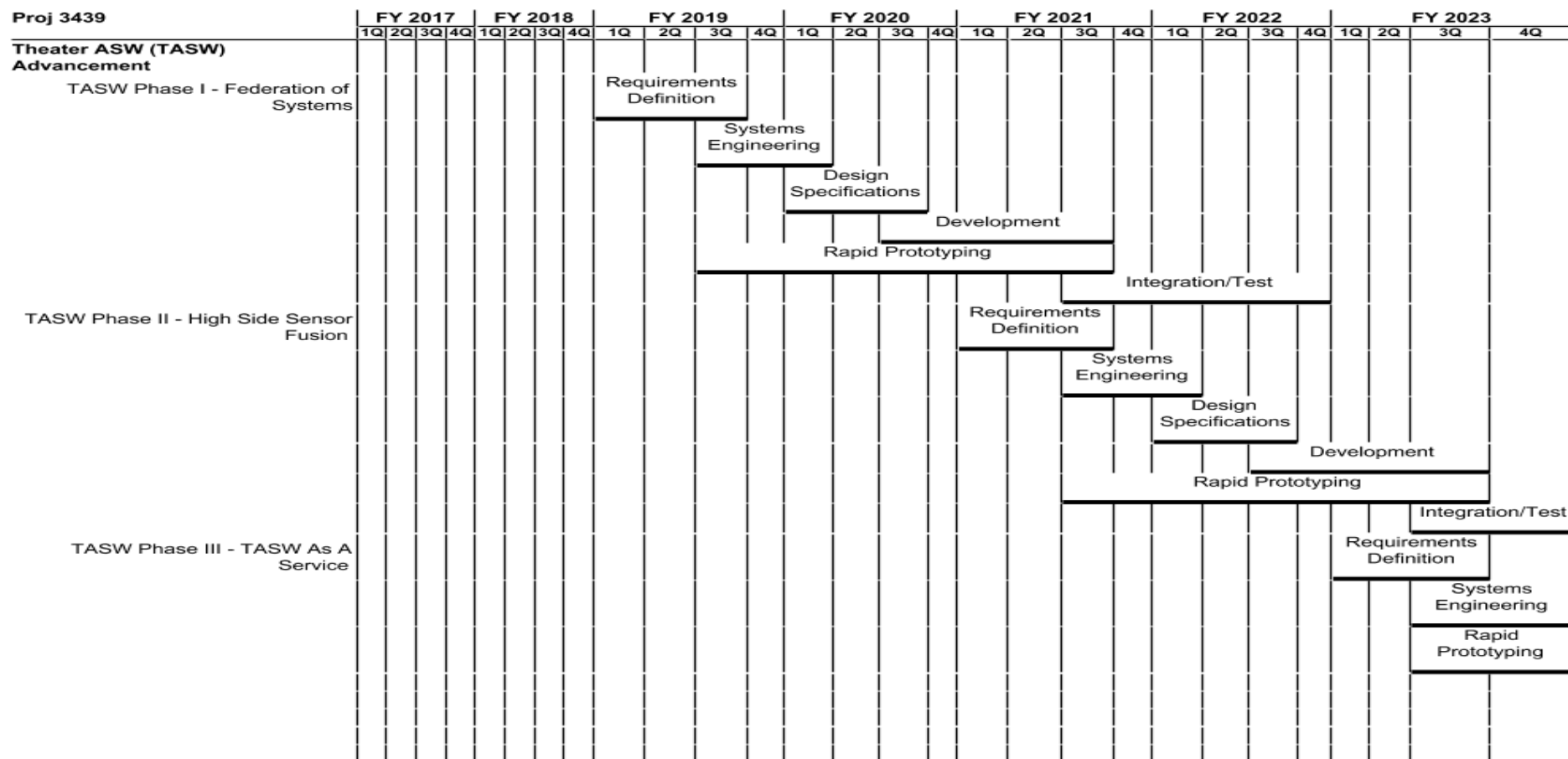
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R-1 Program Element (Number/Name)

PE 0604518N / *Combat Information Center Conv*

Project (Number/Name)

3439 / *Project NAUTICA: Integrated Theater ASW C4I*



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
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
Proj 3439				
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Requirements Definition	1	2019	3	2019
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Systems Engineering	3	2019	1	2020
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Design Specifications	1	2020	3	2020
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Development	3	2020	3	2021
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Rapid Prototyping	3	2019	3	2021
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Integration/Test	3	2021	4	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Requirements Definition	1	2021	3	2021
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Systems Engineering	3	2021	1	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Design Specifications	1	2022	3	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Development	3	2022	3	2023
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Rapid Prototyping	3	2021	3	2023
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Integration/Test	3	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy				Date: February 2018	
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	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Requirements Definition		1	2023	3	2023
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Systems Engineering		3	2023	4	2023
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Rapid Prototyping		3	2023	4	2023