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

| Appropriation/Budget Activity
1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development* | | | | | | R-1 Program Element (Number/Name)
PE 0205620N *I Surface ASW Cmbt Sys Integr* | | | | | |

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	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing
1916: *Surface ASW System Improvement*	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.115 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.

The objective of this Program Element (PE) is to significantly improve existing Surface Ship Undersea Warfare (USW) sonar system capabilities through quick and affordable development/integration of emergent, transformational technologies in support of Littoral Anti-Submarine Warfare (ASW), Theater ASW (TASW), and overall efforts required to pace the threat. Detection and classification play uniquely vital roles in the success of any ASW campaign. The Advanced Capability Build (ACB) spiral development process is the primary means by which these USW improvements are developed.

ASW remains a Navy core competency in a dynamic and uncertain maritime environment. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. Evolving submarine technologies offer enhanced stealth, speed, endurance, weapons, and operational proficiency, trends foretelling that the adversary submarine of the future will have a significantly larger sphere of influence, while presenting less vulnerability to ASW forces. The effective offensive engagement range of the adversary submarine of the future will continue to match or outrange individual U.S. and multinational platform sensors and weapons in many tactical environments. Submarines are an increasing threat to all Naval and Allied ships, particularly modern diesel subs and faster torpedoes. Not only can the presence of potential hostile submarines delay naval combatant action until they are located and neutralized, submarines can also disrupt all seaborne logistics supply for any ground campaign as well as maritime commerce. ASW forces must be effective in all operating environments, ranging from the deep open ocean to the littorals, and are key to countering adversarial anti-access and area denial strategies.

This project takes advantage of the AN/SQQ-89(V) Open System Architecture (OSA) and Acoustic Rapid Commercial-Off-The-Shelf (COTS) Insertion (ARCI) initiatives to integrate Torpedo Detection, Classification, and Localization (TDCL) and ASW sonar combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG and follow FLT I/II/IIA) class ships. The Open Architecture (OA) system enables the ACB process and provides budget flexibility to make COTS/OA technology solutions and ARCI-type initiatives affordable. Improvements are tested in the laboratory and at-sea.

This program will participate in, and take advantage of, the Tactical Advancements for the Next Generation (TANG) initiative that utilizes Commercial Industrial Design Thinking methodologies to engage the Fleet in generating innovative ASW improvement concepts.

Exhibit R-2, **RDT&E Budget Item Justification:** PB 2019 Navy		**Date:** February 2018
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ASW technology implementation will take advantage of improvements developed under the submarine Advanced Processing Build (APB) and Advanced Surveillance Build (ASB) programs and will in turn share unique improvements developed under this program with the submarine and surveillance ASW communities. All three programs (ACB, ASB, and APB) are managed under a common development organization and process titled AxB. While each platform retains its uniqueness and focus in functional domains essential to mission success, a premium is placed on development of common capabilities and modular architecture technologies to maximize commonality and cost effectiveness.

This project will also contribute to the development of Littoral Combat Ship (LCS) ASW Mission Packages and the Frigate (FF) Program.

Project 1916 also includes funding for the Surface Ship Engineering Measurement Program (SSEMP), which will measure the performance of existing and new Surface Ship ASW combat systems and enables data-based assessment of the capabilities and shortfalls in the performance of these systems in realistic scenarios.

This project also includes funding to support cyber security initiatives to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems

B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	24.583	29.351	28.945	-	28.945
Current President's Budget	23.779	29.351	28.421	-	28.421
Total Adjustments	-0.804	0.000	-0.524	-	-0.524
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.788	0.000			
• Program Adjustments	0.000	0.000	-0.151	-	-0.151
• Rate/Misc Adjustments	0.000	0.000	-0.373	-	-0.373
• Congressional General Reductions Adjustments	-0.016	-	-	-	-

Change Summary Explanation
Schedule:
ACB development is now reflected as a continuous pipeline/conveyor process, conducted in parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies.

ACB-15 At-Sea Test has shifted from 3Q17 to 1Q18 due to test ship availability. This shift does not delay delivery to system integrator.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018	

Appropriation/Budget Activity 1319 I 7				R-1 Program Element (Number/Name) PE 0205620N I Surface ASW Cmbt Sys Integr				Project (Number/Name) 1916 I Surface ASW System Improvement			

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
1916: Surface ASW System Improvement	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface ASW Systems Improvements Project will support essential performance enhancements to AN/SQQ-89(V) and Surface Ship Sonar Systems. This project will improve AN/SQQ-89(V) Measures of Performance (MOP) by enhancing operator interface methods and tools, active and passive detection, tracking, classification and localization, torpedo DCL, and sonobuoy data processing and display capabilities, and increasing acoustic sensor frequency bandwidth (Operational Requirements Document #667-76-05 titled 'AN/SQQ-89 Improvement Program'), Test & Evaluation Master Plan (TEMP) 802-2.

This project will take advantage of the TANG initiative, AN/SQQ-89(V) OSA, and ARCI initiatives to integrate a TDCL and ASW sonar and combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG51 and follow FLT I/II/IIA) class ships. This project has delivered the AN/SQQ-89A(V)15 Pre-Production Prototype, performed installation on board CG73, and conducted subsequent Developmental Test & Evaluation (DT&E) and Initial Operational Test & Evaluation (IOT&E) where the system was found 'Operationally Effective' by Command Operational Test and Evaluation Force (COMOPTEVFOR).

The OSA and high performance COTS processing hardware on ships fielded with the AN/SQQ-89A(V)15 combat system provides an opportunity to integrate emergent, transformational ASW technological improvements that were previously unachievable. The USW suites on these ships will require periodic upgrades to remain effective well into the 21st century and to pace the threat. Software upgrades target capability increases in high interest areas as prescribed by the Fleet and captured in campaign analysis. To achieve this, this project will package and deliver incremental upgrades every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-13, ACB-15, etc.) by inserting maturing USW technologies.

Primary areas of USW improvement are as follows:
- Medium Frequency (MF) Pulsed Active Sonar
- Continuous Active Sonar (CAS)
- MF Acoustic Communications
- TDCL
- Torpedo Defense
- Passive Sonar
- Sonar Tactical Decision Aids (STDA)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 I 7	R-1 Program Element (Number/Name) PE 0205620N I *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 I *Surface ASW System Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AN/SQQ-89A(V)15 Surface Ship ASW Advanced Capability Build (ACB) Development	19.879	21.251	21.154	0.000	21.154
Articles:	-	-	-	-	-
Description: Develop enhancements to the AN/SQQ-89A(V)15 Open System Architecture (OSA) via the integration of transformational technologies through the four step ACB spiral development process, enhanced by the TANG initiative. These items will be integrated and delivered to the CG47 and DDG51 class AN/SQQ-89A(V)15 backfit production programs via ACB updates. The ACB four step process: Step 1 - algorithm/technology assessment by peer review panels of Subject Matter Experts (SME) to down-select technologies and assist developers with technical guidance. Step 2 - algorithm/technology testing with open and closed data sets to further down-select and refine capabilities prior to integration and testing. Step 3 - land based system-level testing in a realistic tactical environment. Step 4 - at-sea testing on an operational surface combatant. Step 4 is conducted only if an appropriate platform is available. ACB requirements are generated through discussions with the Fleet, then vetted and provided as direction by CNO, N96. Beginning in FY 2017, Steps 1 and 2 will be conducted in a pipeline style parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies. The content of a specific ACB build (every two years on the odd year) will then be determined through a series of discussions with the Fleet aimed at selecting the most relevant and mature technologies available in the ACB pipeline. Integration at the String and System level will then be performed followed by Steps 3 and 4, as applicable, and transitioned to production. Additionally, import advanced development capabilities from the submarine APB and ARCI projects. Export advanced capabilities to submarine and surveillance combat system programs. Resolve/troubleshoot issues/deficiencies that arise from the AN/SQQ-89(V) Surface Ship ASW Test & Evaluation program. Rapidly address and correct problems/deficiencies in processing, capability or operations within the following areas within the AN/SQQ-89(V) USW combat system architecture; sensor processing, acoustics, fire control, contact management, performance prediction, operator productivity and on-board training, Multi-Function Towed Array (MFTA), Digital Fire Control Interface (DFCI), MFA processing, TDCL, Torpedo Defense and adaptive beamforming.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 I 7	**R-1 Program Element (Number/Name)** PE 0205620N I *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 I *Surface ASW System Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: - Conduct Step 4 at-sea testing of ACB-15. - Continue development and integration of enhancements to the AN/SQQ-89A(V)15 for ACB-19. - Conduct system integration and commence test preparation of ACB-19 for Step 3 land-based testing. - Conduct TI-20 trade studies to support ACB-19 integration and ACB-21 development. - Support the conduct of TANG events. - Continue Common STDA development and initiate studies on Next Generation hardware and software architectures with the goals of virtualization and cyber hardening. Virtualization is intended to reduce software integration costs while increasing flexibility. **FY 2019 Base Plans:** - Complete TI-20 trade studies to support ACB-19 integration and ACB-21 development. - Conduct and complete Step 3 land-based testing of ACB-19. - Conduct ACB-19 Return-on-Investment (ROI) testing. - Transition ACB-19 to production. - Initiate planning and development for ACB-21. Anticipate developing capabilities to improve the attack/engage phase of the kill chain, improve contact localization, improve sonobuoy processing, and increase performance of a ship as a contributor to strike group performance. - Continue Common STDA development. **FY 2019 OCO Plans:** N/A **FY 2018 to FY 2019 Increase/Decrease Statement:** FY 2019 decrease due to general inflation rate adjustments.					
Title: AN/SQQ-89(V) Surface Ship ASW Test & Evaluation Program **Articles:**	0.700 -	0.700 -	0.700 -	0.000 -	0.700 -
FY 2018 Plans: - Begin conduct of ACB-13 OT events. - Continue AIE to support ACB-17 certification. - Finalize test ship and resources in support of ACB-15 OT. - Finalize ACB-15 TEMP. **FY 2019 Base Plans:**					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018	
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Begin conduct of ACB-15 DT events. - Begin conduct of ACB-15 OT events. - Support conduct of AIE for ACB-17 certification. Work test ship and resources in support of ACB-17 DT&E and ACB-17 TEMP. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: Surface Ship Enhanced Measurement Program (SSEMP) ***Articles:***	3.200 -	3.200 -	3.078 -	0.000 -	3.078 -
Description: Analyze the sonar employment in the operational setting and report results for improvement of training/employment guidance. Perform Fleet exercise data reconstruction and post-test analysis each year. Conduct selected at-sea data collection activities by providing planning support, ship riders, and analyst support. Evaluate prototype sonar employment tactics, sonar processing and automation algorithms, and communication protocols for the detection, classification, tracking, and intra-Fleet hand-off to Fleet ASW assets, and provide summary reports to document results. ***FY 2018 Plans:*** - Support ACB-13 Initial Operational Test and Evaluation (IOT&E)/OT data collection and analysis of operational performance. - Support ACB-15 IOT&E/OT data collection planning. - Continue analysis of real-world SSEMP cases and exercise performance data. ***FY 2019 Base Plans:*** - Conduct ACB-13/ACB-15 Level 4 Operator Test analysis. - Support ACB-15 IOT&E/OT data collection and analysis of operational performance. - Continue analysis of real-world SSEMP cases and exercise performance data. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY 2019 decrease due to general inflation rate adjustments.					
Title: AN/SQQ-89A(V)15 Cyber Security Architecture Upgrade	0.000	4.200	3.489	0.000	3.489
Articles:	-	-	-	-	-

Description: Cyber security capability development to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems.

FY 2018 Plans:
- Align system design plans with the Program Executive Office (PEO) Integrated Warfare Systems (IWS) Cyber Security Instruction 5239.1, incorporate support architecture changes required to meet the current cyber security requirements defined in the Risk Management Framework (RMF), and incorporate capabilities to better align with the Defense-In-Depth Functional Implementation Architecture (DFIA) and Information Assurance (IA) Technical Authority Board Implementation Standards.
- Initiate development of cyber security capabilities into AN/SQQ-89A(V)15 Technical Insertion (TI) baselines to support emergent cyber security requirements. These TI's will interface with various Aegis Weapon System (AWS) baselines.
- Initiate development of cyber security capabilities into ACBs to support emergent cyber security specifications such as confidentiality and integrity requirements.
- Initiate efforts to modernize existing software to reduce the cyber security risks to the weapons control component of the system.
- Initiate host level protections and boundary defense capability integration efforts to align with the Secure Combat System Architecture, working towards optimal cyber resiliency.

FY 2019 Base Plans:
- Continue host-level protections and boundary defense capability integration efforts to align with the Secure Combat System Architecture, working towards optimal cyber resiliency.
- Support ongoing implementation efforts to sustain integrity and confidentiality requirements.
- Support RMF Assessment and Authorization (A&A) activities of various ACB/TI combinations, allowing for continuous successful platform installations.

FY 2019 OCO Plans:
N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The decrease in FY 2019 is due to the planned completion in FY 2018 of the efforts required to study, evaluate, and develop initial plans for Cyber Security Architecture upgrade.					
Accomplishments/Planned Programs Subtotals	23.779	29.351	28.421	0.000	28.421

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• OPN/2136: *AN/SQQ-89 Surface ASW Combat System*	87.824	102.222	115.459	-	115.459	125.586	127.452	132.673	135.329	Continuing	Continuing
• RDTEN/0603553N/1704: *Undersea Warfare*	1.039	1.136	1.122	-	1.122	1.145	1.170	1.195	1.220	Continuing	Continuing

Remarks

D. Acquisition Strategy
 - Via an ACB spiral development process, incorporate evolutionary and transformational technologies into AN/SQQ-89A(V)15 production systems.
 - Utilize the Small Business Innovative Research (SBIR) program and full and open competition for new and improved innovative capability development.

E. Performance Metrics
 - Deliver incremental capability increases in high interest areas, as prescribed by the Fleet and captured in campaign analysis, every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-13, ACB-15, ACB-17, etc.) by inserting maturing USW technologies.
 - Conduct system qualification testing (SQT) and Aegis Integration Events (AIE) for all fielded variants of ACB.
 - Utilize the SSEMP to evaluate performance of fielded systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy													Date: February 2018
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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
SQQ-89 S/W Development/Integration	C/CPFF	AAC : NY	6.505	0.000		0.000		0.000		-		0.000	0.000	6.505	-
SQQ-89 S/W Development/Integration	C/CPFF	Alion : IL	6.913	0.915	Nov 2016	1.250	Nov 2017	1.250	Dec 2018	-		1.250	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Adaptive Methods : VA	14.825	0.575	Dec 2016	0.605	Jan 2018	0.625	Dec 2018	-		0.625	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	GD-AIS : VA	11.322	0.000		0.000		0.000		-		0.000	0.000	11.322	-
SQQ-89 S/W Development/Integration	C/CPFF	In-Depth Engineering : VA	2.975	0.000		0.000		0.000		-		0.000	0.000	2.975	-
SQQ-89 S/W Development/Integration	C/CPFF	JHU/APL : MD	31.877	6.059	Nov 2016	6.100	Feb 2018	6.100	Dec 2018	-		6.100	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Metron : VA	4.950	0.500	Nov 2016	0.600	Nov 2017	0.600	Dec 2018	-		0.600	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Lockheed Martin : NY	10.205	0.000		0.000		0.000		-		0.000	0.000	10.205	-
SQQ-89 S/W Development/Integration	C/CPFF	Lockheed Martin : VA	16.055	3.658	Dec 2016	3.650	Jan 2018	3.650	Dec 2018	-		3.650	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	WR	NSWC/Carderock : MD	7.527	0.250	Jan 2017	0.250	Jan 2018	0.246	Nov 2018	-		0.246	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	WR	NSWC/Dahlgren : VA	1.440	0.000		0.000		0.000		-		0.000	0.000	1.440	-
SQQ-89 S/W TDA Support	WR	NUWC/Newport : RI	13.670	2.822	Jan 2017	2.970	Nov 2017	2.963	Nov 2018	-		2.963	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Sedna Digital : VA	4.300	0.105	Feb 2017	0.100	Feb 2018	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	UT/ARL : TX	16.693	1.975	Nov 2016	1.950	Feb 2018	1.950	Dec 2018	-		1.950	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	VAR : VAR*	23.795	2.712	Dec 2016	3.468	Dec 2017	3.398	Dec 2018	-		3.398	Continuing	Continuing	Continuing
SAST Development/ Integration	C/CPFF	JHU/APL : MD	8.302	0.000		0.000		0.000		-		0.000	0.000	8.302	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018	
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SAST Development/ Integration	WR	NSWC/Carderock : MD	13.493	0.000		0.000		0.000		-		0.000	0.000	13.493	-
SAST Development/ Integration	WR	NUWC/Newport : RI	3.080	0.000		0.000		0.000		-		0.000	0.000	3.080	-
SAST Development/ Integration	C/CPFF	Sedna Digital : VA	5.002	0.000		0.000		0.000		-		0.000	0.000	5.002	-
SAST Development/ Integration	C/CPFF	UT/ARL : TX	1.652	0.000		0.000		0.000		-		0.000	0.000	1.652	-
SAST Development/ Integration	C/CPFF	VAR : VAR*	0.812	0.000		0.000		0.000		-		0.000	0.000	0.812	-
SQQ-89 CyberSecurity Development/Integration	C/CPFF	Lockheed Martin : VA	0.000	0.000		3.360	Jan 2018	2.800	Dec 2018	-		2.800	0.000	6.160	-
SQQ-89 CyberSecurity Development/Integration	WR	NSWC/Dahlgren : VA	0.000	0.000		0.630	Jan 2018	0.517	Nov 2018	-		0.517	0.000	1.147	-
SQQ-89 CyberSecurity Development/Integration	WR	NUWC/Newport : RI	0.000	0.000		0.210	Nov 2017	0.172	Nov 2018	-		0.172	0.000	0.382	-
		Subtotal	205.393	19.571		25.143		24.371		-		24.371	Continuing	Continuing	N/A

<u>Remarks</u>
 *Consists of multiple performing activities with funding for each not greater than $1M per year.
 Note: SAST Development/Integration cost category is not used effective FY17. SAST was developed stand-alone, but has been integrated into the AN/SQQ-89 ACB baseline.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSEMP ConductTest/Data Evaluation	C/CPFF	JHU/APL : MD	16.165	2.100	Nov 2016	2.100	Feb 2018	2.025	Dec 2018	-		2.025	Continuing	Continuing	Continuing
SSEMP Conduct/Test/ Data Evaluation	WR	NUWC/Newport : RI	3.912	0.500	Jan 2017	0.500	Nov 2017	0.475	Nov 2018	-		0.475	Continuing	Continuing	Continuing
SSEMP Conduct/Test/ Data Evaluation	C/CPFF	UT/ARL : TX	4.878	0.600	Nov 2016	0.600	Feb 2018	0.578	Dec 2018	-		0.578	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018

Appropriation/Budget Activity 1319 I 7	R-1 Program Element (Number/Name) PE 0205620N I *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 I *Surface ASW System Improvement*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SQQ-89 IV&V/SAT/TEMP Assess./Update	WR	NUWC/Newport : RI	2.826	0.400	Jan 2017	0.400	Nov 2017	0.400	Nov 2018	-		0.400	Continuing	Continuing	Continuing
SQQ-89 DT/OT/ Miscellaneous T&E	WR	VAR : VAR*	2.685	0.300	Dec 2016	0.300	Feb 2018	0.300	Dec 2018	-		0.300	Continuing	Continuing	Continuing
Subtotal			30.466	3.900		3.900		3.778		-		3.778	Continuing	Continuing	N/A

Remarks

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

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAE Systems : MD	2.999	0.000		0.000		0.000		-		0.000	0.000	2.999	-
Program Management Support	C/CPIF	CGI Federal : VA	0.250	0.250	Nov 2016	0.250	Feb 2018	0.214	Dec 2018	-		0.214	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.856	0.058	Nov 2016	0.058	Feb 2018	0.058	Oct 2018	-		0.058	Continuing	Continuing	Continuing
Subtotal			4.105	0.308		0.308		0.272		-		0.272	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	239.964	23.779		29.351		28.421	-	28.421	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy | **Date:** February 2018

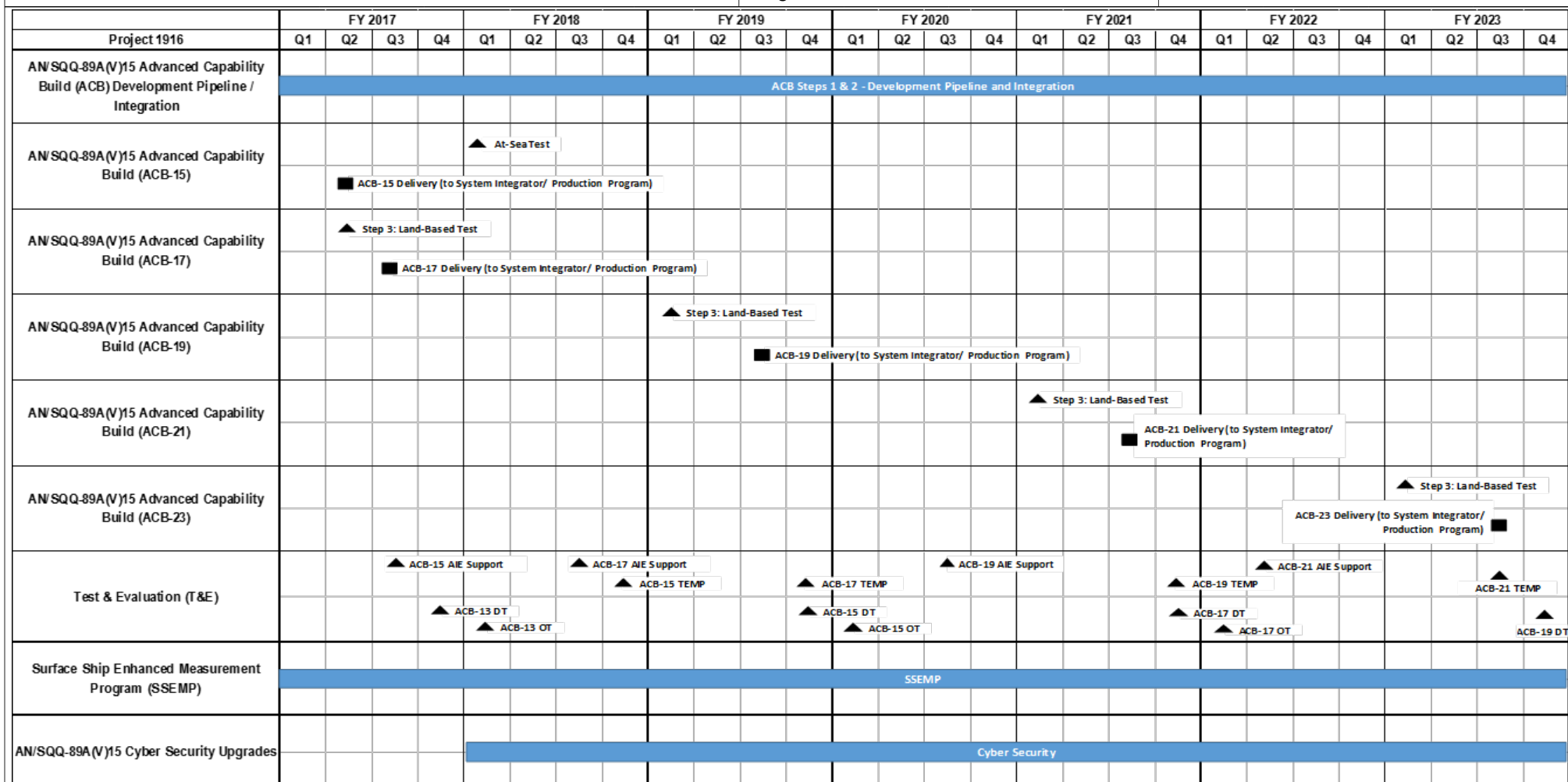| Appropriation/Budget Activity 1319 I 7	R-1 Program Element (Number/Name) PE 0205620N I *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 I *Surface ASW System Improvement*

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 *I* 7	**R-1 Program Element (Number/Name)** PE 0205620N *I Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 *I Surface ASW System Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1916				
AN/SQQ-89A(V)15 Advanced Capability Build: AN/SQQ-89A(V)15 Advanced Capability Build Development Pipleline	1	2017	4	2023
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 Step 4 At-Sea Test	1	2018	1	2018
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 S/W Delivery to Integrator	2	2017	2	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 Step 3 Land-Based Test (LBT)	2	2017	2	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 S/W Delivery to Integrator	3	2017	3	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 Step 3 Land-Based Test (LBT)	1	2019	1	2019
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 S/W Delivery to Integrator	3	2019	3	2019
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 Step 3 Land-Based Test (LBT)	1	2021	1	2021
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 S/W Delivery to Integrator	3	2021	3	2021
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-23): AN/SQQ-89A(V)15 ACB-23 Step 3 Land-Based Test (LBT)	1	2023	1	2023
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-23): AN/SQQ-89A(V)15 ACB-23 S/W Delivery to Integrator	3	2023	3	2023
Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Developmental Test (DT)	4	2017	4	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Operational Test (OT)	1	2018	1	2018

Exhibit R-4A, **RDT&E Schedule Details:** PB 2019 Navy				**Date:** February 2018	
Appropriation/Budget Activity 1319 *I* 7		**R-1 Program Element (Number/Name)** PE 0205620N *I Surface ASW Cmbt Sys Integr*		**Project (Number/Name)** 1916 *I Surface ASW System Improvement*	

	Start		**End**	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Aegis Integration Event (AIE)	3	2017	3	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 T&E Master Plan (TEMP)	4	2018	4	2018
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Developmental Test (DT)	4	2019	4	2019
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Operational Test (OT)	1	2020	1	2020
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Aegis Integration Event (AIE)	3	2018	3	2018
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 T&E Master Plan (TEMP)	4	2017	4	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Developmental Test (DT)	4	2021	4	2021
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Operational Test (OT)	1	2022	1	2022
Test & Evaluation: AN/SQQ-89A(V)15 ACB-21 Aegis Integration Event (AIE)	2	2022	2	2022
Test & Evaluation: AN/SQQ-89A(V)15 ACB-21 T&E Master Plan (TEMP)	3	2023	3	2023
Test & Evaluation: AN/SQQ-89A(V)15 ACB-19 Aegis Integration Event (AIE)	3	2020	3	2020
Surface Ship Enhanced Measurement Program (SSEMP): AN/SQQ-89A(V)15 ACB-19 Developmental Test (DT)	4	2023	4	2023
Surface Ship Enhanced Measurement Program (SSEMP): AN/SQQ-89A(V)15 ACB-19 T&E Master Plan (TEMP)	4	2021	4	2021
Surface Ship Enhanced Measurement Program (SSEMP): Surface Ship Enhanced Measurement Program (SSEMP)	1	2017	4	2023
AN/SQQ-89A(V)15 Cyber Security Upgrades: AN/SQQ-89A(V)15 Cyber Security Upgrades	1	2018	4	2023