

<b>CLASSIFICATION:</b>	<b>UNCLASSIFIED</b>
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<b>EXHIBIT R-2, RDT&amp;E BUDGET ITEM JUSTIFICATION</b>	DATE May 2009
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDTEN/BA 7</b>	<b>R-1 ITEM NOMENCLATURE</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	16.478	22.441	41.803				
1916 / Surface ASW System Improvement	9.509	21.643	41.803				
9999 / CONGRESSIONAL ADDS	6.969	0.798	0.000				

**A. MISSION DESCRIPTION:**

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, Mine Reconnaissance, and overall Sea Shield efforts required to pace the threat.

Project 1916's primary mission is to improve AN/SQQ-89(V) Measures Of Performance (MOP) by enhancing detection, tracking, classification, active 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' dated 31-Jan-05, Test and Evaluation Master Plan 801 and 802-2 (TEMP 801 & TEMP 802-2)). 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 develop and integrate a Multi-Function Towed Array (MFTA) with active sonar bistatics (Echo Tracker Classifier - ETC), an ARCI passive Anti-Submarine Warfare (ASW) processor, and torpedo defense capabilities (Forward and Aft sector coverage with Wake Homer protection). This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (CG59-73 Baseline 3 and 4) and DDG51 (DDG51-112 FLT I/II/IIA) class ships. The Open Architecture (OA) (level 3 compliant) of the AN/SQQ-89A(V)15 system drives the Advanced Processor Build (APB)/Advanced Capability Build (ACB) spiral development process and provides budget flexibility to make COTS/OA technology solutions and ARCI-type initiatives affordable. This will be accomplished via the incorporation of select Pre-Planned Product Improvements (P3I) and emergent, transformational ASW technologies delivered to the AN/SQQ-89(V) prime integrator every two years.

Project 1916 also includes funding for the Surface Ship Enhanced 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.

Project 1916 also includes funding, starting in FY 2009, for the Surface ASW Synthetic Training (SAST) program (under the Surface Ship ASW Synthetic Signatures Generation and Training Acceleration Initiative), including the development of a high fidelity acoustic simulation of a surface ship sonar. This effort will accelerate the implementation and integration of the Submarine Multi-Mission Team Trainer (SMMTT) Navy Continuous Training Environment (NCTE) solution/baseline to the surface ship paradigm.

FY 2008 Congressional Add - Project 9C60A included FY 2008 Congressional Add funding for 'Advanced Materials for Acoustic Window Applications'. Funding is being used to study the feasibility of replacing existing sonar window materials with a material that has the potential to provide a Total Ownership Cost (TOC) reduction of three (3) to five (5) times for acoustic windows used on Navy surface combatants such as the DDG 51 and DDG 1000 Class vessels, while improving mission readiness and acoustic performance.

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<b>EXHIBIT R-2, RDT&amp;E BUDGET ITEM JUSTIFICATION (CONTINUATION)</b>	DATE May 2009
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<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDTEN/BA 7</b>	<b>R-1 ITEM NOMENCLATURE</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>
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FY 2008/2009 Congressional Adds - Project 9C61A included FY 2008/2009 Congressional Add funding for 'Long Range Synthetic Aperture Sonar for ASW'. Funding will be used to initiate processor prototype system architecture, requirements modeling, and performance predictions for an ASW Synthetic Aperture Sonar system utilizing the current Navy sonar assets of an AN/SQS-53 hull mounted sonar and the MFTA.

**B. PROGRAM CHANGE SUMMARY:**

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	18.117	21.720	28.455
FY10 President's Budget	16.478	22.441	41.803
Total Adjustments	-1.639	0.721	13.348
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	-0.014	0.798	0.000
SBIR/STTR/FTT Assessment	-0.275	0.000	0.000
Program Adjustments	-1.350	0.000	14.000
Rate/Misc Adjustments	0.000	-0.077	-0.652
Total	-1.639	0.721	13.348

**C. OTHER PROGRAM FUNDING SUMMARY:**

Related RDT&EN:

PE 0603553N Surface ASW, Project 1704 Undersea Warfare

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
OPN BLI 2136 AN/SQQ-89 Surface ASW Combat System	31.844	101.859	111.093	244.796
OPN BLI 0900 DDG Modernization	52.694	165.008	142.262	359.964
OPN BLI 0960 CG Modernization	216.031	165.165	315.323	696.519

**D. ACQUISITION STRATEGY:**

- Completed AN/SQQ-89A(V)15 Surface Ship ASW Combat System Build 0 Pre-Production Prototype, performed installation, conducted DT&E, and Initial IOT&E 4Q FY 2005. Via Advanced Processor Build (APB)/Advanced Capability Build (ACB) spiral development process, incorporate evolutionary and transformational technologies into AN/SQQ-89A(V)15 production systems (planned for CGs 59-73 and DDGs 51-112) at scheduled intervals to pace the threat.

- Awarded new, competitive contract for AN/SQQ-89(V) prime system integrator in FY 2007.

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<b>EXHIBIT R-2, RDT&amp;E BUDGET ITEM JUSTIFICATION (CONTINUATION)</b>		<b>DATE</b> May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RDTEN/BA 7</b>	<b>R-1 ITEM NOMENCLATURE</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>	
<p><b>E. MAJOR PERFORMERS:</b></p> <ul style="list-style-type: none"> <li>- Advanced Acoustic Concepts (AAC), NY - Small Business Innovative Research (SBIR) Phase III contract for common acoustic processor, Acoustic Intercept (ACI), Supportability Functional Segment (SuPFS), Mission Planning Services (MPS), and Surface CAUSS (Common Airborne Undersea Sensor System) Functional Segment (SCFS) improvements within the AN/SQQ-89A(V)15 USW Combat System.</li> <li>- Analysis, Design &amp; Diagnostics (AD&amp;D), FL - SBIR Phase III contract for Marine Mammal Detection and Mitigation (MMDM) improvements within the AN/SQQ-89A(V)15 USW Combat System.</li> <li>- Applied Methods (AM), VA - SBIR Phase III contract for common acoustic processor, Data Fusion Functional Segment (DFFS), and towed array/Beamformer Functional Segment (BFFS), BFFS/Recording Functional Segment (RecFS) common architecture, and RecFS improvements within the AN/SQQ-89A(V)15 USW Combat System.</li> <li>- General Dynamics - Advanced Information Systems (GD-AIS), VA - SBIR Phase III contract for common acoustic processor, Sensor Performance Prediction Functional Segment (SPPFS), Passive Acoustic Functional Segment (PAFS), Torpedo Recognitional Alertment Functional Segment (TRAFS), and Low Frequency Multi-static Functional Segment (LFMFS) improvements within the AN/SQQ-89A(V)15 USW Combat System.</li> <li>- Johns Hopkins University/Applied Physics Laboratory (JHU/APL), MD - Design, development, and integration of MFTA and Torpedo Detection Classification and Localization (TDCL) improvements within the AN/SQQ-89A(V)15 USW Combat System; SSEMP participation in experiment planning, conduct, data reconstruction and post-exercise analysis; implementation/integration of Surface ASW Synthetic Training development program.</li> <li>- Lockheed Martin (LM), NY - Prime AN/SQQ-89(V) USW Combat System integrator, production lead, and System Design Agent (SDA); Undersea Warfare Control Functional Segment (UCFS), Hull Passive Processing Functional Segment (HPPFS), and Common System Services Functional Segment (CSSFS) improvements within the AN/SQQ-89A(V)15 USW Combat System.</li> <li>- Naval Sea Systems Command, Newport (NUWC/NPT), RI - AN/SQQ-89(V) USW Combat System and Surface ASW Synthetic Training Technical Design Agent support; SSEMP participation in experiment planning, conduct, data reconstruction and post-exercise analysis.</li> <li>- Naval Sea Systems Command, Carderock, (NSWC/CD) MD - SPPFS improvements within the AN/SQQ-89A(V)15 USW Combat System; Surface ASW Synthetic Training development program Technical Design Agent support.</li> <li>- Sedna Digital Solutions, VA - System/software design/development for synthetic signature generation in support of the Surface ASW Synthetic Training development program.</li> <li>- University of Texas/Applied Research Laboratory (UT/ARL), TX - Design, development, and integration of Mid Frequency Active Functional Segment (MFAFS) and SPPFS improvements within the AN/SQQ-89A(V)15 USW Combat System; SSEMP participation in experiment planning, conduct, data reconstruction and post-exercise analysis; implementation/integration of Surface ASW Synthetic Training development program.</li> </ul>		

<b>CLASSIFICATION:</b>		<b>UNCLASSIFIED</b>						
<b>EXHIBIT R-2a, RDT&amp;E PROJECT JUSTIFICATION</b>					<b>DATE</b> May 2009			
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>		<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>				<b>PROJECT NUMBER AND NAME</b> <b>1916/Surface ASW System Improvement</b>		
<b>COST (In Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>					
Project Cost	9.509	21.643	41.803					
RDT&E Articles Qty	0	0	0					
<b>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</b>								
<p>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) MOP by enhancing detection, tracking, classification, active 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' dated 31-Jan-05), Test and Evaluation Master Plan 801 and 802-2 (TEMP 801 &amp; TEMP 802-2).</p> <p>This project will take advantage of the AN/SQQ-89(V) OSA and ARCI initiatives to develop and integrate a MFTA with active sonar bistatics (ETC), an ARCI passive ASW processor, and torpedo defense capabilities (Forward and Aft sector coverage with Wake Homer protection). This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (CG59-73 Baseline 3 and 4) and DDG51 (DDG51-112 FLT I/II/IIA) class ships. This project has delivered the AN/SQQ-89A(V)15 Build 0 Pre-Production Prototype, performed installation on board CG73, and conducted subsequent Developmental Test &amp; Evaluation (DT&amp;E) and Initial Operational Test &amp; Evaluation (IOT&amp;E) where the system was found 'Operationally Effective' by Command Operational Test and Evaluation Force (COMOPTEVFOR).</p> <p>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 select P3I as well as emergent, transformational ASW technological improvements that were previously unachievable. The Undersea Warfare (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 Advanced Processor Build (APB) spiral development process (APB-09, APB-11, APB-13, etc.) by inserting maturing USW technologies, such as enhancements to improve USW performance in the littoral, reduced manning on AN/SQQ-89(V) equipped ships (operator efficiency upgrades via the implementation of robust embedded data record and replay capability and active/passive sonar simulation/stimulation), Detection/Classification/Localization active/passive processing upgrades (passive sonar automated detection and classification processing bell-ringers from the ASW Community-of-Interest, detect and track thru maneuvers, integration of MH-60R mission systems with the AN/SQQ-89A(V)15 combat system, integration of Mid-Frequency active detection improvements, false-alarm rate reduction, clutter reduction, and integration of ASW Community-of-Interest improved acoustic intercept and small-object avoidance), ASW Multi-Sensor integration (acoustic similar-source fusion and implementation of integrated shipboard system data, and ASW combat display architecture and reduced watch-team operational concept implementation), distributed engagement management (Network Centric Enterprise Services implementation, new displays and decision aids, ASW Community-of-Interest model capabilities implementation), marine mammal detection and mitigation, Multi-Static Active ASW, Multi-Frequency Acoustic Communications (MF ACOMMS) between Surface Combatants and Submarines, new RAPTOR radar processing, and upgraded technologies such as algorithm improvements, increased Passive Narrow Band (PNB) frequency, improved Extended Echo Ranging (EER), and beamformer improvements. A rigorous testing program is also required to ensure that these performance enhancements are operationally effective and suitable.</p>								

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<b>EXHIBIT R-2a, RDT&amp;E PROJECT JUSTIFICATION (CONTINUATION)</b>		DATE May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>	<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>	<b>PROJECT NUMBER AND NAME</b> <b>1916/Surface ASW System Improvement</b>
<p>Project 1916 also includes funding for the Surface Ship Enhanced 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.</p> <p>Project 1916 also includes funding, starting in FY 2009, for the Surface ASW Synthetic Training (SAST) program (under the Surface Ship ASW Synthetic Signatures Generation and Training Acceleration Initiative), including the development of a high fidelity acoustic simulation of a surface ship sonar based on the Improved Performance Sonar (IPS) baseline. This effort will accelerate the implementation and integration of the Submarine Multi-Mission Team Trainer (SMMTT) Navy Continuous Training Environment (NCTE) solution/baseline to the surface ship paradigm for high fidelity passive simulation, improvement of active acoustics, development of a rapid acoustic reconstruction capability, and to ensure FST interoperability via the On-Board Trainer (OBT)/Battle Force Tactical Trainer (BFTT). SAST capability will be fielded throughout the force, via ACB updates to the AN/SQQ-89A(V)15 system, while spiraling in additional ASW sensors, as well as full High Level Architecture (HLA)/NCTE interoperability.</p>		

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<b>EXHIBIT R-2a, RDT&amp;E PROJECT JUSTIFICATION</b>				<b>DATE</b> May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>	<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>	<b>PROJECT NUMBER AND NAME</b> <b>1916/Surface ASW System Improvement</b>		
<b>B. ACCOMPLISHMENTS/PLANNED PROGRAM:</b>				
		<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<b>SQQ-89A(V)15 Surface Ship ASW Advanced Processor Build (APB) Development</b>		5.809	10.443	23.103
RDT&E Articles Quantity		0	0	0
<p>FY08-10: Develop enhancements to the AN/SQQ-89A(V)15 OSA via the integration of transformational technologies through an Advanced Processor Build (APB) spiral development process. Items include hull-mounted Acoustic Intercept (ACI) sensor, ACI performance predictions and signal injection capabilities, Marine Mammal Detection and Mitigation (MMDM) capability, hull array adaptive beamformer and towed array shape compensated beamformer improvements via the Beamformer Functional Segment (BFFS), Mid-Frequency Active (MFA) Cooperative Organic Mine Defense (COMID) mine avoidance upgrades, MFA rapid replay and multi-waveform tracker, Hull Passive Functional Segment (HPPFS) improvements, Sensor Performance Prediction Functional Segment (SPPFS) improvements, Low Frequency Multi-Static Functional Segment (LFMFS) improvements, Undersea Warfare Control Functional Segment (UCFS) improvements, Supportability Functional Segment (SuPFS) improvements, Recording Functional Segment (ReCFS) improvements, Common System Services/Mission Package Services (CSS/MSS) improvements, full bandwidth towed array passive ASW and automated Torpedo Detection, Classification, and Localization (TDCL) algorithm improvements (active/passive) within the Torpedo Recognition and Alertment Functional Segment (TRAFS) necessary to extend detection ranges and reduce false alert/alarm rates, new Data Fusion Functional Segment (DFFS) sensor to reduce the number of displays required for system operation, Multi-Frequency Acoustic Communications (MF ACOMMS) development, integration of MH-60R mission systems with the AN/SQQ-89A(V)15 combat system, Extended Echo Ranging (EER) "Distant Thunder" integration into the AN/SQQ-89A(V)15 Surface Common Airborne Undersea Sensor System (CAUSS) Functional Segment airframe sensor processing suite, explosive source integration with AN/SQQ-89A(V)15 processes, simplification of displays and active processing, incorporation of all Improved Performance Sonar (IPS) and Scaled Improved Performance Sonar (SIPS) features, and a Sonar Logger capability to significantly reduce operator data logging requirements. These items will be integrated and delivered to the CG47 and DDG51 class AN/SQQ-89A(V)15 backfit production programs via Advanced Capability Build (ACB) updates.</p> <p>FY08-10: Resolve/troubleshoot issues/deficiencies that arise from AN/SQQ-89(V) Surface Ship ASW Test &amp; 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, MMDM, fire control, contact management, performance prediction, operator productivity and on-board training, MFTA, Digital Fire Control Interface (DFCI), Remote Mine-Hunting System (RMS), MFA processing, and adaptive beamforming.</p>				
		<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<b>AN/SQQ-89(V) Surface Ship ASW Test &amp; Evaluation Program</b>		0.700	0.700	0.700
RDT&E Articles Quantity		0	0	0
<p>FY08-10: Provide AN/SQQ-89(V) Surface Ship ASW test and evaluation planning support, System Assessment Team (SAT) analysis, update Test &amp; Evaluation Master Plan (TEMP) to reflect the AN/SQQ-89A(V)15 APB/ACB spiral development program, coordinate and conduct at-sea tests/trial demonstrations of AN/SQQ-89(V) systems and associated APB/ACB/Technology Insertion (TI) capabilities, provide performance data and environmental analysis, Independent Verification &amp; Validation (IV&amp;V), and modeling and simulation using MOP and Measures Of Effectiveness (MOE) methods.</p>				

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<b>EXHIBIT R-2a, RDT&amp;E PROJECT JUSTIFICATION (CONTINUATION)</b>				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY <b>RD TEN/BA 7</b>	PROGRAM ELEMENT NUMBER AND NAME <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>	PROJECT NUMBER AND NAME <b>1916/Surface ASW System Improvement</b>		
		FY 2008	FY 2009	FY 2010
<b>Surface Ship Enhanced Measurement Program (SSEMP)</b>		3.000	3.000	3.000
RDT&E Articles Quantity		0	0	0
<p>FY08-10: Measure the performance of existing and new Surface Ship ASW combat systems and data based assessment of the capabilities and shortfalls in the performance of these systems in realistic scenarios. Evaluate the effectiveness of the transition of processing improvements in the surface ship sonar system. Evaluate system operational performance and identify performance deficits that need to be addressed by system processing improvements, employment modifications, and/or training improvements. Establish baseline performance and compare operational performance to the predicted sensor performance to establish performance deficit/gain metrics. 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.</p>				
		FY 2008	FY 2009	FY 2010
<b>Surface ASW Synthetic Training (SAST) Development Program</b>		0.000	7.500	15.000
RDT&E Articles Quantity		0	0	0
<p>FY09-10: Begin development of a high fidelity acoustic simulation of a surface ship sonar based on the Improved Performance Sonar baseline under the Surface Ship ASW Synthetic Signatures Generation and Training Acceleration Initiative. Accelerate the implementation and integration of the Submarine Multi-Mission Team Trainer (SMMTT) Navy Continuous Training Environment (NCTE) solution/baseline to the surface ship paradigm for high fidelity passive simulation, improvement of active acoustics, development of a rapid acoustic reconstruction capability, and to ensure SAST interoperability via the On-Board Trainer (OBT)/Battle Force Tactical Trainer (BFTT). SAST capability will be fielded throughout the force, via ACB updates to the AN/SQQ-89A(V)15 system, while spiraling in additional ASW sensors, as well as full High Level Architecture (HLA)/NCTE interoperability.</p>				

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 7		PROGRAM ELEMENT NUMBER AND NAME 0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION					PROJECT NUMBER AND NAME 1916/Surface ASW System Improvement					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
SQQ-89 S/W Development/Integration	C/CPFF	AAC, NY	2.508			0.400	JAN-09	4.590	NOV-09		7.498	0.000
SQQ-89 S/W Development/Integration	WR	NAVSEA/DAHLGREN, VA	0.835			1.702	DEC-08	0.520	NOV-09		3.057	0.000
SQQ-89 S/W Development/Integration	C/CPFF	AM, VA	6.801			0.900	DEC-08	3.987	NOV-09		11.688	0.000
SQQ-89 S/W Development/Integration	C/CPFF	GD-AIS, VA	9.206			1.212	JAN-09	4.304	NOV-09		14.722	0.000
SQQ-89 S/W Development/Integration	C/CPFF	JHU/APL, MD	1.535			0.742	MAR-09	0.760	DEC-09		3.037	0.000
SQQ-89 S/W Development/Integration	C/CPFF	LOCKHEED MARTIN, NY	1.205			2.355	DEC-08	3.170	NOV-09		6.73	0.000
SQQ-89 S/W Development/Integration	WR	NAVSEA/CARDEROCK, MD	0.200			0.200	DEC-08	0.520	NOV-09		0.92	0.000
SQQ-89 S/W TDA Support	WR	NAVSEA/NEWPORT, RI	1.618			0.990	NOV-08	1.050	NOV-09		3.658	0.000
SQQ-89 S/W Development/Integration	C/CPFF	UT/ARL, TX	1.824			0.681	DEC-08	2.558	DEC-09		5.063	0.000
SQQ-89 S/W Development/Integration	WR	VAR, VAR	0.748			0.777	NOV-08	1.147	NOV-09		2.672	0.000
SAST Development/Integration	C/CPFF	JHU/APL, MD	0.000			0.802	DEC-08	3.750	DEC-09		4.552	0.000
SAST Development/Integration	WR	NAVSEA/CARDEROCK, MD	0.000			5.391	DEC-08	3.750	NOV-09		9.141	0.000
SAST Development/Integration	WR	NAVSEA/NEWPORT, RI	0.000			0.450	NOV-08	2.250	NOV-09		2.7	0.000
SAST Development/Integration	C/CPFF	SEDNA, VA	0.000			0.000		4.500	NOV-09		4.5	0.000
SAST Development/Integration	C/CPFF	UT/ARL, TX	0.000			0.857	DEC-08	0.750	DEC-09		1.607	0.000
<b>Subtotal Product Development</b>			<b>26.480</b>			<b>17.459</b>		<b>37.606</b>			<b>81.545</b>	<b>0.000</b>
Remarks:												
SSEMP Conduct/Test/Data Evaluation	C/CPFF	JHU/APL, MD	1.905			1.905	DEC-08	1.905	DEC-09		5.715	0.000
SSEMP Conduct/Test/Data Evaluation	WR	NAVSEA/NEWPORT, RI	0.456			0.456	NOV-08	0.456	NOV-09		1.368	0.000
SSEMP Conduct/Test/Data Evaluation	C/CPFF	UT/ARL, TX	0.639			0.639	DEC-08	0.639	DEC-09		1.917	0.000
SQQ-89 IV&V/SAT/TEMP Assess./Update	WR	NAVSEA/NEWPORT, RI	0.576			0.350	NOV-08	0.350	NOV-09		1.276	0.000
SQQ-89 DT/OT/Miscellaneous T&E	WR	VAR	0.775			0.350	NOV-08	0.350	NOV-09		1.475	0.000
<b>Subtotal Test and Evaluation</b>			<b>4.351</b>			<b>3.700</b>		<b>3.700</b>			<b>11.751</b>	<b>0.000</b>
Remarks:												
Program Management Support	C/CPAF	BAE SYSTEMS, MD	1.075			0.384	NOV-08	0.397	NOV-09		1.856	0.000
Program Office Travel	ALLOT	NAVSEA PEO IWS5, DC	0.329			0.100	NOV-08	0.100	NOV-09		0.529	0.000
<b>Subtotal Management Services</b>			<b>1.404</b>			<b>0.484</b>		<b>0.497</b>			<b>2.385</b>	<b>0.000</b>

<b>CLASSIFICATION:</b>		<b>UNCLASSIFIED</b>										
<b>EXHIBIT R-3, RDT&amp;E PROJECT COST ANALYSIS</b>										DATE May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>		<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>					<b>PROJECT NUMBER AND NAME</b> <b>1916/Surface ASW System Improvement</b>					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
Remarks:												
<b>Total Cost</b>			<b>32.235</b>			<b>21.643</b>		<b>41.803</b>			<b>95.681</b>	<b>0.000</b>

**CLASSIFICATION:**

**UNCLASSIFIED**

**EXHIBIT R-4, SCHEDULE PROFILE**

**DATE**

May 2009

**APPROPRIATION/BUDGET ACTIVITY**  
**RDTEN/BA 7**

**PROGRAM ELEMENT NUMBER AND NAME**  
**0205620N/SURFACE ASW COMBAT SYSTEM INTEGRAT**

**PROJECT NUMBER AND NAME**  
**1916/Surface ASW System Improvement**

Fiscal Year	2008				2009				2010																				
	1	2	3	4	1	2	3	4	1	2	3	4																	
<b>Acquisition/Contract Milestones/Reviews</b> AN/SQQ-89A(V)15 Prime System Integrator Contract Award 3Q07			▲ SIBR	▲ SIDR																									
<b>Development/Integration Milestones</b> AN/SQQ-89A(V)15 Software Sensor Segment Development/Integration/Certification - <b>ACB-09</b>	ACB-09 Cert.						▲ SQT																						
AN/SQQ-89A(V)15 Software Sensor Segment Development/Integration/Certification - <b>ACB-11</b>		ACB-11 Development/Step Evaluation/PRT/Integration/Cert.																											
AN/SQQ-89A(V)15 Software Sensor Segment Development/Integration/Certification - <b>ACB-13</b>					ACB-13 Development/Step Evaluation/PRT/Integration/Cert.																								
Surface ASW Synthetic Training (SAST) Development and Functional Segment/Spiral Integration into AN/SQQ-89A(V)15 - <b>ACB-11</b>					ACB-11 Functional Segment Integration																								
<b>Test &amp; Evaluation Milestones</b> AN/SQQ-89A(V)15 Developmental Test & Evaluation (DT&E) (Completed FY04), AN/SQQ-89A(V)15 Initial Operational Test & Evaluation (IOT&E) (Completed FY05, 'Operationally Effective' per COMOTEVFOR)	Conduct Fleet exercise data collection, reconstruction, and post-test analysis of Surface Ship ASW system operational performance																												
<b>Production/Delivery Milestones</b> AN/SQQ-89A(V)15 Production Software <b>ACB-09</b> Delivery to System Prime/Integrator																													
AN/SQQ-89A(V)15 Backfit Fielding Plans Install Start Date Shown; Sequential System # Shown in ( ) by Platform																													
DDG FLT IIA (OPN BLI 2136)																													
CG B/L III/IV (OPN BLI 0960)																													
DDG FLT I/II (OPN BLI 0900)																													

<b>CLASSIFICATION:</b>		<b>UNCLASSIFIED</b>					
<b>EXHIBIT R-4a, SCHEDULE DETAIL</b>						DATE May 2009	
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>		<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>			<b>PROJECT NUMBER AND NAME</b> <b>1916/Surface ASW System Improvement</b>		
Schedule Profile		FY 2008	FY 2009	FY 2010			
SQQ-89A(V)15 System Integ. Baseline Review (SIBR)		3Q					
SQQ-89A(V)15 System Integration Design Review (SIDR)		4Q					
SQQ-89A(V)15 ACB-09 Certification		1Q-3Q					
SQQ-89A(V)15 ACB-09 Software Qualification Test (SQT)		4Q					
SQQ-89A(V)15 ACB-11 Dev./Step Eval./PRT/Integ./Cert.		4Q	1Q-4Q	1Q-3Q			
SQQ-89A(V)15 ACB-11 SQT				4Q			
SQQ-89A(V)15 ACB-13 Dev./Step Eval./PRT/Integ./Cert.				4Q			
Surface ASW Synthetic Trng. (SAST) ACB-11 Func. Seg. Integ.			1Q-4Q	1Q-3Q			
SAST ACB-11 SQT				4Q			
Surface Ship Enhanced Measurement Program (SSEMP)		2Q-4Q	1Q-4Q	1Q-4Q			
SQQ-89A(V)15 ACB-09 Prdtn. S/W Delivery to Integrator			1Q				
SQQ-89A(V)15 DDG51 Class FLT IIA Backfit Install			3Q-4Q	1Q,4Q			
SQQ-89A(V)15 DDG51 Class FLT I/II Backfit Install				3Q			

<b>CLASSIFICATION:</b>		<b>UNCLASSIFIED</b>		
<b>EXHIBIT R-2a, RDT&amp;E PROJECT JUSTIFICATION</b>				<b>DATE</b> May 2009
<b>APPROPRIATION/BUDGET ACTIVITY</b> <b>RD TEN/BA 7</b>	<b>PROGRAM ELEMENT NUMBER AND NAME</b> <b>0205620N/SURFACE ASW COMBAT SYSTEM INTEGRATION</b>	<b>PROJECT NUMBER AND NAME</b> <b>9999/CONGRESSIONAL ADDS</b>		
<b>B. ACCOMPLISHMENTS/PLANNED PROGRAM:</b>				
		<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<b>Advanced Materials for Acoustic Window Applications</b>		6.198	0.000	0.000
RDT&E Articles Quantity		0	0	0
<p>FY 2008 Congressional Add: Study the feasibility of replacing existing sonar window materials with a material that has the potential to provide a Total Ownership Cost (TOC) reduction of three (3) to five (5) times for acoustic windows used on Navy surface combatants such as the DDG 51 and DDG 1000 Class vessels, while improving mission readiness and acoustic performance. A full-scale, prototype composite AN/SQS-53C sonar window is currently being built as a first-article window. Based on the lessons learned from the first-article window produced, a second-article window is planned to be installed on a decommissioned (test-ship) Surface Combatant. After subsequent at-sea testing, data analysis, and refined modeling &amp; simulation, a third-article window will be installed, tested, and analyzed, on an in-service Surface Combatant (DDG51 Class).</p>				
		<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<b>Long Range Synthetic Aperture Sonar for ASW</b>		0.771	0.798	0.000
RDT&E Articles Quantity		0	0	0
<p>FY 2008/2009 Congressional Adds: Initiate processor prototype system architecture, requirements modeling, and performance predictions for an ASW Synthetic Aperture Sonar system utilizing the current Navy sonar assets of an AN/SQS-53 hull mounted sonar and the MFTA. A Synthetic Aperture Sonar has the potential to significantly reduce false alarms and eliminate clutter from current US Navy ASW sonar systems. The creation of a synthetic longer array will provide acoustically derived images of contacts at extended ranges supporting the initial detection and rapid classification of ASW threats most notably irrespective of Doppler and in environments of high clutter. It does this through the synthetic formation of an aperture that provides narrow beams and constant resolution with range. This allows the formation of an image of the physical shape and aspect of the contact allowing the rejection of non ASW threat shapes as clutter while identifying high probability ASW threats.</p>				