DEPARTMENT OF THE NAVY
FISCAL YEAR (FY) 2010
BUDGET ESTIMATES

JUSTIFICATION OF ESTIMATES
MAY 2009

RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY
BUDGET ACTIVITY 4

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Research, Development, Test and Evaluation, Navy

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $19,378,112,000, to remain available for obligation until September 30, 2011.

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Department of the Navy
FY 2010/2011 President's Budget
Exhibit R-1 FY 2010 Base and Overseas Contingency Operations (OCO) Request
Summary
(Dollars in Thousands)

05 MAY 2009

Summary Recap of Budget Activities	FY 2008 Base&OCO Actuals	FY 2009 Base&OCO SupReq 4/9/09	FY 2010 Base	FY 2010 OCO	FY 2010 Total
Advanced Component Development & Prototypes	3,161,661	3,520,741	4,163,795	17,000	4,180,795
Total Research, Development, Test & Eval, Navy	3,161,661	3,520,741	4,163,795	17,000	4,180,795

Summary Recap of FYDP Programs					
Research and Development	3,161,661	3,520,741	4,163,795	17,000	4,180,795
Classified Programs					
Total Research, Development, Test & Eval, Navy	3,161,661	3,520,741	4,163,795	17,000	4,180,795

Exhibit R-1Q: FY 2010 Base and Overseas Contingency Operations (OCO) Request, as of May 5, 2009 at 14:13:59

* Reflects $30.510 million of a proposed $2.9 billion cancellation from the Department’s base budget (the Consolidated Security, Disaster Assistance, and Continuing Appropriations, Act 2009, (Public Law 110-329), for fuel savings to offset a portion of the additional Emergency Requests in FY 2009 Overseas Contingency Operations Supplemental Request (Acceleration/Grow the Force, Family Support, and National Capital Region Acceleration). Also reflects a $5.0 million cancellation for certain classified programs that are now excess to requirements.

Department of the Navy
FY 2010/2011 President's Budget Exhibit R-1 FY 2010 Base and Overseas Contingency Operations (OCO) Request

Line No	Program Element Number	Item	Act	FY 2008 Base&OCO Actuals	FY 2009 Base&OCO SupReq 4/9/09	FY 2010 Base	FY 2010 OCO	FY 2010 Total	S E C
26	0603207N	Air/Ocean Tactical Applications	04	39,300	67,533	116,082		116,082	U
27	0603216N	Aviation Survivability	04	21,302	13,674	6,505	8,000	14,505	U
28	0603237N	Deployable Joint Command and Control	04	8,906	7,086	6,032		6,032	U
29	0603254N	ASW Systems Development	04	20,640	37,081	16,585		16,585	U
30	0603261N	Tactical Airborne Reconnaissance	04	6,837	4,286	7,713		7,713	U
31	0603382N	Advanced Combat Systems Technology	04	9,620	7,125	1,677		1,677	U
32	0603502N	Surface and Shallow Water Mine Countermeasures	04	88,432	123,095	76,739		76,739	U
33	0603506N	Surface Ship Torpedo Defense	04	32,668	51,591	57,538		57,538	U
34	0603512N	Carrier Systems Development	04	85,742	147,710	173,594		173,594	U
35	0603513N	Shipboard System Component Development	04	42,565	26,830	1,691		1,691	U
36	0603525N	PILOT FISH	04	129,504	85,466	79,194		79,194	U
37	0603527N	RETRACT LARCH	04	104,556	92,800	99,757		99,757	U
38	0603536N	RETRACT JUNIPER	04	46,373	158,582	120,752		120,752	U
39	0603542N	Radiological Control	04	2,666	1,091	1,372		1,372	U
40	0603553N	Surface ASW	04	45,671	48,243	21,995		21,995	U
41	0603561N	Advanced Submarine System Development	04	152,499	150,826	551,836	9,000	560,836	U
42	0603562N	Submarine Tactical Warfare Systems	04	14,685	13,772	10,172		10,172	U
43	0603563N	Ship Concept Advanced Design	04	39,652	31,019	22,541		22,541	U
44	0603564N	Ship Preliminary Design & Feasibility Studies	04	25,611	24,789	28,135		28,135	U

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Department of the Navy
FY 2010/2011 President's Budget Exhibit R-1 FY 2010 Base and Overseas Contingency Operations (OCO) Request

Line No	Program Element Number	Item	Act	FY 2008 Base&OCO Actuals	FY 2009 Base&OCO SupReq 4/9/09	FY 2010 Base	FY 2010 OCO	FY 2010 Total	S E C
45	0603570N	Advanced Nuclear Power Systems	04	165,140	157,841	259,887		259,887	U
46	0603573N	Advanced Surface Machinery Systems	04	1,555	9,175	5,599		5,599	U
47	0603576N	CHALK EAGLE	04	196,258	351,113	443,555		443,555	U
48	0603581N	Littoral Combat Ship (LCS)	04	309,446	368,277	360,518		360,518	U
49	0603582N	Combat System Integration	04	52,316	64,204	22,558		22,558	U
50	0603609N	Conventional Munitions	04	7,018	8,102	3,458		3,458	U
51	0603611M	Marine Corps Assault Vehicles	04	240,532	255,274	293,466		293,466	U
52	0603612M	USMC Mine Countermeasures Systems - Adv Dev	04	801					U
53	0603635M	Marine Corps Ground Combat/ Support System	04	54,405	65,261	73,798		73,798	U
54	0603654N	Joint Service Explosive Ordnance Development	04	80,949	114,201	21,054		21,054	U
55	0603658N	Cooperative Engagement	04	34,916	42,999	56,586		56,586	U
56	0603713N	Ocean Engineering Technology Development	04	8,812	7,716	17,328		17,328	U
57	0603721N	Environmental Protection	04	20,413	20,776	20,661		20,661	U
58	0603724N	Navy Energy Program	04	5,968	10,283	8,476		8,476	U
59	0603725N	Facilities Improvement	04	9,175	18,835	4,002		4,002	U
60	0603734N	CHALK CORAL	04	26,502	117,225	70,772		70,772	U
61	0603739N	Navy Logistic Productivity	04	18,910	17,798	4,301		4,301	U
62	0603746N	RETRACT MAPLE	04	349,905	137,493	210,237		210,237	U
63	0603748N	LINK PLUMERIA	04	88,361	60,100	69,313		69,313	U

* Reflects $30.510 million of a proposed $2.9 billion cancellation from the Department’s base budget (the Consolidated Security, Disaster Assistance, and Continuing Appropriations, Act 2009, (Public Law 110-329), for fuel savings to offset a portion of the additional Emergency Requests in FY 2009 Overseas Contingency Operations Supplemental Request (Acceleration/Grow the Force, Family Support, and National Capital Region Acceleration). Also reflects a $5.0 million cancellation for certain classified programs that are now excess to requirements.

Department of the Navy
FY 2010/2011 President's Budget Exhibit R-1 FY 2010 Base and Overseas Contingency Operations (OCO) Request

Line No	Program Element Number	Item	Act	FY 2008 Base&OCO Actuals	FY 2009 Base&OCO SupReq 4/9/09	FY 2010 Base	FY 2010 OCO	FY 2010 Total	SEC
64	0603751N	RETRACT ELM	04	71,887	138,762	152,151		152,151	U
65	0603755N	Ship Self Defense	04	10,617	10,971	6,960		6,960	U
66	0603764N	LINK EVERGREEN	04	64,987	75,789	123,660		123,660	U
67	0603787N	Special Processes	04	42,779	60,461	54,115		54,115	U
68	0603790N	NATO Research and Development	04	10,960	10,102	10,194		10,194	U
69	0603795N	Land Attack Technology	04	49,919	17,984	1,238		1,238	U
70	0603851M	Nonlethal Weapons	04	56,459	49,165	46,971		46,971	U
71	0603860N	Joint Precision Approach and Landing Systems	04	66,789	77,215	150,304		150,304	U
72	0603879N	Single Integrated Air Picture (SIAP) System Engineer (SE)	04	45,615	41,682	52,716		52,716	U
73	0603889N	Counterdrug RDT&E Projects	04	65,177					U
74	0603925N	Directed Energy and Electric Weapon Systems	04	3,470	4,548	5,003		5,003	U
75	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	32,364	66,663	63,702		63,702	U
76	0604450N	Joint Air-to-Ground Missile (JAGM)	04	11,626					U
77	0604653N	Joint Counter Radio Controlled IED Electronic Warfare (JCREW)	04			67,843		67,843	U
78	0604659N	Precision Strike Weapons Development Program	04			40,926		40,926	U
79	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	40,401	48,127	42,533		42,533	U
		Advanced Component Development & Prototypes		3,161,661	3,520,741	4,163,795	17,000	4,180,795	
		Total Research, Development, Test & Eval, Navy		3,161,661	3,520,741	4,163,795	17,000	4,180,795	

* Reflects $30.510 million of a proposed $2.9 billion cancellation from the Department’s base budget (the Consolidated Security, Disaster Assistance, and Continuing Appropriations, Act 2009, (Public Law 110-329), for fuel savings to offset a portion of the additional Emergency Requests in FY 2009 Overseas Contingency Operations Supplemental Request (Acceleration/Grow the Force, Family Support, and National Capital Region Acceleration). Also reflects a $5.0 million cancellation for certain classified programs that are now excess to requirements.

EXHIBIT R-2, RDT&E Budget Item Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4					R-1 ITEM NOMENCLATURE PE 0603207N Air/Ocean Tactical Applications			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	**39.300**	**67.531**	**116.082**					
2341 METOC Data Acquisition	14.155	19.765	22.028					
2342 METOC Data Assimilation and Modeling	13.323	18.590	19.424					
2343 Tactical METOC Applications	4.383	6.368	16.164					
2344 Precise Timing and Astrometry	1.035	20.215	2.258					
3207 Fleet Synthetic Training		0.997	1.008					
3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)			55.200					
9999 Congressional Increases	6.404	1.596						

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Air Ocean Tactical Applications (AOTA) Program Element is fully aligned with Navy's Sea Power 21 concept to enhance the future mission capabilities of the Navy-Marine Corps Team. New state-of-the art government and commercial technologies are identified, transitioned, demonstrated and then integrated into Combat Systems and FORCEnet-related programs of record and Tactical Decision Aids (TDAs) that determine in real-time and near-real-time the operational effects of the physical environment on the performance of combat forces and their new and emerging platforms, sensors, systems and munitions. The AOTA program element focuses on sensing and characterizing the littoral and deep-strike battlespace in the context of regional conflicts and crisis response scenarios. Projects in this program element transition state-of-the art sensing, assimilation, modeling and decision aid technologies from Government and commercial sources. Unique project development efforts include atmospheric and oceanographic data assimilation techniques, forecast models, data base management systems and associated software for use in mainframe, desktop and laptop computers. Global Geospatial Information and Services efforts within this program address the bathymetric and gravimetric needs of the Navy. Also developed are algorithms to process new satellite sensor data for integration into Navy and Marine Corps decision support systems and for display as part of the common operational and tactical pictures. In addition, the projects provide for demonstration and validation of specialized atmospheric and oceanographic instrumentation and measurement techniques, new sensors, communications and interfaces. Included are new capabilities to assess, predict and enhance the performance of current and emerging undersea warfare and mine warfare weapons systems. AOTA capabilities are designed to support the latest versions of the Global Command and Control System (GCCS), the new Network Enterprise Command and Control (NECC) system (formerly called Joint Command and Control (JC2)), and specific unit-level combat systems. This program also develops representations of the physical environment for incorporation into Navy and Marine Corps warfare trainers and simulations. Finally, this program develops technological upgrades for the U.S. Naval Observatory's Master Clock system to keep pace with the demands of modern military communications, cryptographic, intelligence, geolocation, and targeting systems; develops near-real-time earth orientation predictions; develops very precise determination of positions of both faint and bright stars; and supports satellite tracking and space debris studies.

Funding increases to project 2343, Tactical METOC Applications, beginning in FY10 are the result of technical corrections to the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program's funding profile in order to more appropriately reflect the software only nature of the effort. The net result of these zero sum technical changes are reductions to the NITES-Next OP,N (BLI 4226 Meteorological Equipment) profile & subsequent dollar for dollar increases to the program's RDT&E,N profile.

Funding increases to project 2342, METOC Data Acquisition, in FY10 reflects the beginning of the System Development and Demonstration (SDD) phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV) portion of the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) program, and are the result of technical changes to the program's funding profile. The net result of these zero sum technical changes, are reductions to the LBS-UUV OP,N (BLI 4226 Meteorological Equipment) profile & subsequent dollar for dollar increases to the program's RDT&E,N profile.

Funding increases to project 2342, METOC Data Assimilation and Modeling, in FY10 are in support of the Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities effort, and reflects the need for additional data assimilation algorithms and applications resulting from the launch of the NPOESS Preparatory Project (NPP) satellite.

Funding increase to project 3229 is for the Office of Naval Research's (ONR) Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) satellite program in FY10, FY09 efforts budgeted in project 2344, Precise Timing and Astrometry, $19M.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA 4	R-1 ITEM NOMENCLATURE PE 0603207N Air/Ocean Tactical Applications

(U) B. PROGRAM CHANGE SUMMARY:

(U) Funding:		FY 2008	FY 2009	FY 2010	FY 2011
FY09 President's Submit		43.406	66.133	46.725	
FY10 President's Submit		39.300	67.531	116.082	
Total Adjustments		(4.106)	1.398	69.357	
Summary of Adjustments					
Miscellaneous Adjustments			(0.199)	(0.819)	
Program Adjustments		4.106		70.176	
Congressional Increase			1.600		
	Subtotal	4.106	1.401	69.357	

(U) Schedule:

Schedules for the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) and Naval Integrated Tactical Environmental System Next Generation (NITES-Next) programs have been updated to reflect technical corrections to the program's funding profiles and resulting increased developmental efforts beginning in FY10.

(U) Technical:

Not applicable

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2341 METOC Data Acquisition			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**14.155**	**19.765**	**22.028**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The major thrust of the Meteorology and Oceanography (METOC) Data Acquisition Project is to provide Future Mission Capabilities to warfighters that will allow them to detect and monitor the conditions of the physical environment throughout the entire battlespace. New sensor technologies (including unmanned vehicles, tactical sensor exploitation, in-situ sensors, etc.) identified as the most promising candidates are transitioned from the government's and commercial industry's technology base to this project. These new sensor technologies are then demonstrated, validated and integrated into operational programs of record for use by warfighters. These new sensor capabilities are to provide timely and accurate METOC data and products to operational and tactical level of war commanders. As the emphasis on Naval Warfare has evolved from blue water operations to the littoral and deep strike battlespace, METOC data requirements have likewise evolved. The littoral and deep strike regions are extremely dynamic and complex, characterized by strong and highly variable oceanographic and atmospheric conditions. As a result, the need to accurately characterize these conditions is more crucial than ever in planning and executing Amphibious Warfare, Mine Warfare, Special Operations, Anti-Submarine Warfare (ASW), and Strike Warfare operations. Routinely available data sources, such as climatology, oceanographic and meteorological numerical models, and satellite remote sensing are necessary but not sufficient to support these warfare areas in the littoral and deep strike regions. Current operational sensors, such as the standard balloon-launched radiosound, are deployed from platforms that are frequently located great distances from the target area of interest. The principal challenge is to provide a means for the collection and dissemination of METOC data in highly variable and dynamic littoral environmental conditions or in denied, remote or inaccessible areas over extended periods of time. The principal goals of this project are to: 1) provide the means to rapidly and automatically acquire a broad array of METOC data using both off-board and on-board sensors; 2) provide an on-scene assessment capability for the tactical commander; 3) provide the tactical commander with real-time METOC data and products for operational use; 4) demonstrate and validate the use of tactical workstations and desktop computers for processing and display of METOC data and products using latest networking technologies; 5) demonstrate and validate techniques which employ data compression, connectivity and interface technologies to ingest, store, process, distribute and display these METOC data and products; 6) develop new charting and bathymetric survey techniques necessary to reduce the existing shortfall in coastal hydrographic survey requirements; 7) develop an expanded database for predictive METOC models in areas of interest; and 8) support the development of radar weather using Through-The-Sensor (TTS) techniques and development of ocean glider and Autonomous Undersea Vehicles (AUV), sensors, Tracking and Telemetry, and Mission Planning System (MPS) as part of the Littoral Battlespace Sensing, Fusion and Integration (LBSF&I) Program.

Funding in FY10 reflects the beginning of the System Development and Demonstration (SDD) phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV) portion of the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) program, and are the result of technical changes to the program's funding profile. The net result, of these zero sum technical changes, are reductions to the LBS-UUV OP,N (BLI 4226 Meteorological Equipment) profile & subsequent dollar for dollar increases to the program's RDT&E,N profile.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition

(U) B. Accomplishments/Planned Program

Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	4.331	4.841	7.361	
RDT&E Articles Quantity				

FY08 - Began development of glider prototypes and the planned tracking and telemetry components of the unmanned systems in preparation of Milestone C (FY10). Sensor integration and validation/ verification tests were initiated. Continued development glider prototypes, including the development and testing of integrated sensors. Completed related studies (communications, databasing, data flow, etc.) and system engineering plans. Continued development of a common Tracking and Telemetry and vehicle mission planning system. Demonstrated and test components. Developed requirements, specifications, and standards for the glider, Tracking and Telemetry, and Mission Planning systems in preparation for Milestone C and for use in related Joint Capabilities Integration & Development System (JCIDS) documentation.

FY09 - Continue development of end-to-end LBSF&I Increment 1.0 glider sensor and support systems. Begin testing and demonstration of end to end glider systems in preparation for MS C and LRIP in FY10. Define Increment 2.0 requirements and definition of Spiral 2 improved Unmanned Undersea Vehicles and associated support systems (launch and recovery, mission planning, test equipment, etc.). Conduct Spiral 2 studies (Analyses of Alternatives, Engineering Studies, etc.). Begin preparations for the System Development and Demonstration (SDD) phase of the Autonomous Undersea Vehicle (AUV) component of this program.

FY10 - Complete the System Development and Demonstration (SDD) phase of the Littoral Battlespace Sensing - Glider (LBS-G) system (Milestone C is scheduled for Q2FY10). Complete at-sea and ashore Development Testing and Evaluation (DT&E) of the complete end-to-end glider system including command and control, mission planning, launch and recovery, mission profile characteristics and other Key Performance Parameters (KPPs) and Key System Parameters (KSAs). Continue developing the LBS-G Spiral 2.0 definition and associated engineering studies and analyses of alternatives. Begin the SDD phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV) phase. Funding increase reflects the beginning of the System Development and Demonstration (SDD) phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV) portion of the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) program.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2341 METOC Data Acquisition	

(U) B. Accomplishments/Planned Program

USMC Meteorological Mobile Facility (Replacement) Next Generation (METMF(R) NEXGEN)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	2.491	0.000	0.000	
RDT&E Articles Quantity				

FY08 - Conducted operational testing of METMF(R) NEXGEN (formerly METMF(R) NG) prototypes and prepared for delivery.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition

(U) B. Accomplishments/Planned Program

Meteorlogical and Oceanographic (METOC) Furture Mission Capabilities (FMC)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	6.435	7.537	9.338	
RDT&E Articles Quantity				

FY08 - METOC Future Capabilities continued development and test of the military Aircraft Communications Addressing and Reporting System (ACARS) and exploited Intelligence Surveillance & Reconnaissance (ISR) sensors for manned & unmanned platforms for environmental information. Continued use of Naval Special Warfare (NSW), Mine Warfare tactical sensors for Through-the-Sensor (TTS) applications for environmental assessment and characterization. Developed, demonstrated & tested TTS concept for undersea warfare systems. Continued development of the SPS-48E and SPS-48G Radar Obsolescence and Availability (ROAR) Hazardous Weather Detection and Display Capability (HWDDC). Tested and demonstrated the HWDDC system. Began work with SPS-48G developer to integrate algorithms into ROAR. Continued development of the SPY-1 TEP prototype. Completed related studies (communications, databasing, data flow, etc.) and system engineering plans. Completed development of the HWDDC requirements, specifications, and standards for the HWDDC system in preparation for procurement and for use in related JCIDS documentation. Began development of TEP requirements, specifications, standards and system engineering plans for the TEP system. Mapping, Charting & Geodesy (MC&G) product analysis and development. Architecture and design of Mission Planning Systems and support elements in support of littoral combat operations. Data analysis and processing development for environmental characterization for Mission Planner & Tactical Decision Aid use. Developed quality control, fusion and product uncertainty tools and techniques to transform data into information to support product development for mission planners and TDA use. Developed techniques and tools to guide adaptive sampling to optimize use of measurement assets. Developed advanced Geospatial Information and Services (GI&S) databases and data processing tools and techniques to support boundary conditions for numerical forecast models. Developed advanced data fusion tools and interface modules to ocean and atmospheric data assimilation systems.

FY09 - Continue advanced component and prototype efforts associated with acquiring environmental data. Continue development of advanced data measurement and survey techniques to improve survey planning and execution. Continue development of improved data quality control technologies and the automation of data acquisition processes. Continue to develop advanced technologies and techniques to improve Geospatial Information and Services (GI&S) capabilities within Navy METOC production centers and throughout the fleet user base. Implement through-the-sensor (TTS) technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis and C4I distribution systems. Development of the SPY-1 TEP prototype and integration of HWDDC into the SPS-48G ROAR. Developed TEP requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program. Work with the SPS-48G program office and prime contractor to integrate HWDDC algorithms into the ROAR system.

FY10 - Continue advanced component and prototype efforts associated with acquiring environmental data. Continue development of advanced data measurement and survey techniques to improve survey planning and execution. Continue development of improved data quality control technologies and the automation of data acquisition processes. Continue to develop advanced technologies and techniques to improve Geospatial Information and Services (GI&S) capabilities within Navy METOC production centers and throughout the fleet user base. Implement through-the-sensor (TTS) technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, C4I distribution, and tactical decision systems. Developed TEP requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition	

(U) B. Accomplishments/Planned Program

Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	2.223	0.094	
RDT&E Articles Quantity				

FY09 - Support METOC data transport, storage, delivery, design and development efforts in a Net-centric environment for pre-Milestone C Naval Integrated Tactical Environmental Subsystem Next Generation (NITES-Next) activities.

FY10 - Continued support for METOC data transport, storage, delivery, design and development efforts from FY09 in preparation for Milestone C Naval Integrated Tactical Environmental Subsystem Next Generation (NITES-Next) activities.

Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/NITES)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.342	0.231	0.000	
RDT&E Articles Quantity				

FY08 - Finalized Naval Integrated Tactical Environmental Subsystem (NITES) Data (formerly known as Tactical Environmental Data (TED) Services) integration efforts and prepared for COMOPTEVFOR operational evaluation (OPEVAL) with Command and Control Systems.

FY09 - Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/NITES) software development and testing for technology upgrades, refreshes, migrations, and system engineering efforts.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2341 METOC Data Acquisition	

(U) B. Accomplishments/Planned Program

Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.556	0.433	5.235	
RDT&E Articles Quantity				

FY08 - Completed integration of GAIT Version 2 algorithms into Fleet Combat Systems, Anti-submarine Warfare (ASW) Tactical Decision Aids (TDAs) and for use aboard Naval Oceanographic Office (NAVOCEANO) assets. Commenced development of the GAIT Version 3 algorithms. Engineering studies and preliminary design for a passive seabed classification system to be used aboard submarines, next-generation surface ships and aboard Maritime Patrol & Reconnaissance Aircraft (MPRA.) Continued development of ambient noise assimilation capability aboard submarines. Began development of advanced geo-acoustic merging algorithms to support inversions. Conducted submarine fathometer (BQN-17) Automated Sediment Classification System (ASCS) validation. Developed, demonstrated & tested Through-the-Sensor (TTS) concept for undersea warfare systems. Architecture and design of Mission Planning Systems and support elements in support of littoral combat operations. Data analysis and processing development for environmental characterization for Mission Planner & Tactical Decision Aid use. Developed quality control, fusion and product uncertainty tools and techniques to transform data into information to support product development for mission planners and TDA use. Development of techniques and tools to guide adaptive sampling to optimize use of measurement assets. Developed advanced processing tools to work with insitu data sources to populate environmental database and support forward deployed oceanographic personnel. Continued development work, test and document adaptive hydrographic and seafloor survey work for transition to the unmanned vehicles, small surface craft and T-AGS 60 class ships.

FY09 - Geo-acoustic data inversion (through-the-sensor) efforts rolled into the Ocean Bottom Characterization Initiative (OBCI). Expand ambient noise through-the-sensor collection and assimilation capability to include current and future MPRA platforms like the Multi-Mission Maritime Aircraft (MMA) and future surface combatant platforms like the Littoral Combat Ship (LCS) and the Next Generation Destroyer (DD(X)). Develop techniques and algorithms to collect atmospheric refractivity data in support of Anti-Submarine Warfare (ASW) operations. Continue to develop, test and demonstrate advanced Geographic Information Systems (GIS) in support of world-wide Ant Submarine Warfare (ASW) operations. Develop mission planning tools in support of littoral combat operations. Develop capability to quickly calculate transmission loss (TL) values in tactical timeframes. Continue data analysis and processing development for environmental characterization for mission planning & tactical decision aid use. Continue development, test/document and quality control fusion and product uncertainty tools and techniques to transform data into information to support product development for mission planners and tactical decision aid (TDA) use. Continue development, test and validation of techniques and tools to guide adaptive sampling to optimize use of measurement assets. Develop both acoustic and non-acoustic ASW reconstruction and analysis algorithms and techniques to aid in environmental analysis of Naval exercises. Develop and validate ASW product effectiveness metrics algorithms. Develop and validate methods for a theater-wide ambient noise planning tool using all available data sources. Develop next-generation shipping noise quantification, data fusion and forecast algorithms. Design the automated model metrics system. Continue to develop and demonstrate advanced processing tools to work with insitu data sources to populate environmental database and support forward deployed oceanographic personnel. Development and demonstration of advanced insitu sensor systems to support very near shore situational awareness in support of Anti-Submarine Warfare missions. Continue development, verify and validate performance and document adaptive geoacoustic survey work for transition to unmanned vehicles and T-AGS 60 class ships. Continue the development and demonstration of micro-miniature oceanographic and atmospheric in-situ sensors & systems. Utilize tactical and survey platforms for insitu measurements.

FY10 - Continue FY09 efforts. Continue to develop, test and demonstrate advanced mission planning tools and Geographic Information Systems (GIS) in support of world-wide Undersea Warfare (USW) operations. Continue to develop capability to calculate transmission loss (TL) values in tactical timeframes to include uncertainty quantification of those values. Develop and validate both acoustic and non-acoustic USW product effectiveness algorithms to aid in environmental analysis of Naval exercises. Develop and validate methods for a theater-wide ambient noise planning and forecasting capability. Ocean Bottom Characterization Initiative (OBCI): Develop and demonstrate advanced in-situ sensor systems to support littoral environmental awareness in support of USW missions. Use operational Navy platforms for in-situ oceanographic and acoustic measurements. Develop Next Generation bottom loss and backscatter databases and database structures. Develop improved techniques to support geoacoustic and oceanographic survey operations. Develop algorithms for inclusion of bioacoustic effects in acoustic surveys. FY09 OBCI efforts were accomplished under the Ocean Bottom Characterization Initiative (OBCI) project.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2341 METOC Data Acquisition	

(U) B. Accomplishments/Planned Program

Ocean Bottom Characterization Initiative (OBCI)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	4.500	0.000	
RDT&E Articles Quantity				

FY09 - Develop capability to rapidly map coastal and deep-water seabed geoacoustic properties through characterization of seabed variability. Design offboard geo-acoustic survey platform and sensor prototypes for deployment aboard T-AGS class ships and other Naval Oceanographic Office (NAVOCEANO) assets. Continue development, validation and verification of the Delivered Geophysical Acoustic Inversion Toolkit (GAIT) Version 3 bottom loss algorithms for AntiSubmarine Warfare Tactical Decision Aids (ASW TDAs) and NAVOCEANO assets to include active inversion methods. Continue development of a passive seabed classification system. Verify & validate performance of Through The Sensor (TTS) applications for inclusion in Navy Standard databases. Continue development of advanced geo-acoustic merging algorithms to support inversions. Pursue adaptive sampling techniques for NAVOCEANO geoacoustic survey assets. Characterize backscatter (i.e. reverberation) data for inclusion in NAVOCEANO databases. Adapt ocean glider and autonomous underwater vehicle (AUV) sensors and behavior algorithms to support NAVOCEANO survey operations. Perform gravity/seismic data set correlation to improve geoacoustic databases. Extend bandwidth of existing bottom loss databases and algorithms to include all active and passive tactical acoustic frequencies. Define frequency extrapolation limits of existing reverberation data sets. Continue to develop prototype replacement acoustic source for NAVOCEANO survey operations. Begin development of active acoustic clutter characterization algorithms into Fleet Synthetic Training (FST) systems. Adapt the Generalized Acoustic Bottom Interaction Model (GABIM) to act as the first-order solution for a comprehensive, integrated system to generate an acoustic bottom loss and backscatter database in regions of strategic Navy interest. Provide technical and program management oversight for the Ocean Bottom Characterization Initiative (OBCI). Continue investigation of Low Frequency Active (LFA) source to characterize the seabed.

FY10 - Efforts rolled into the Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW) program.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2341 METOC Data Acquisition

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPN 4226 METEOROLOGICAL EQUIPMENT	16.625	24.669	21.458					

RELATED RDT&E: PE 0604218N, Air/Ocean Equipment Engineering

(U) D. ACQUISITION STRATEGY:

Acquisition, management and contracting strategies are to support the METOC Data Acquisition Project to develop, demonstrate, and validate METOC data collection methods and sensors, and to evolve the ability to provide timely and accurate METOC data and products to the Tactical Commander, all with management oversight by the Program Executive Officer for Command, Control, Communications, Computers, and Intelligence (PEO C4I).

(U) E. MAJOR PERFORMERS:

Not applicable

(U) F. METRICS:

Earned Value Management (EVM) is used for metrics reporting and risk management.

Exhibit R-3 Cost Analysis (page 1)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 2341 METOC Data Acquisition				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development												
	WX	NRL	41.875	5.620	N/A	6.487	N/A					
	WX	SSC	15.949	2.964	N/A	3.068	N/A					
	WX	MISC	7.329	0.790	N/A	0.892	N/A					
	CP	MISC	24.419	6.796	N/A	11.373	N/A					
	CPIF	Teledyne Brown Eng, AL	3.166	3.391	N/A							
Subtotal Product Development			92.738	19.561	N/A	21.820	N/A					
Remarks:												
Support Costs												
	CP	MISC	2.260	0.204	N/A	0.208	N/A					
Subtotal Support Costs			2.260	0.204	N/A	0.208	N/A					
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 2341 METOC Data Acquisition				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
	WX	OPTEVFOR	0.160		N/A		N/A					
	MP	JITC	0.040		N/A		N/A					
Subtotal Test & Evaluation			0.200	0.000	N/A	0.000	N/A					
Remarks:												
Management Services												
Subtotal Management Services			0.000	0.000	N/A	0.000	N/A					
Remarks:												
Total Cost			95.198	19.765	N/A	22.028	N/A					

Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition - Program: Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV)

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LBSF&I UUV	Studies	AUV MS B			Spiral 1 AUV Sys Dev & Dem																											
			Glider MS B		Glider Sys Dev & Dem						Glider MS C		Glider IOC																			

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2341 METOC Data Acquisition - Program: Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
LBS-UUV								
Gliders								
Milestone B (MS B)	2Q							
System Development & Demonstration (SDD)	3Q - 4Q	1Q - 4Q	1Q - 2Q					
Milestone C (MS C)			2Q					
Initial Operating Capability (IOC)			4Q					
AUV								
Milestone B (MS B)	2Q							
System Development & Demonstration (SDD)	3Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																																
																															DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY					PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME																
RDT&E, N / BA-4					PE 0603207N Air/Ocean Tactical Applications												2341 METOC Data Acquisition - Program: METMF(R) NEXGEN																
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones	System Development & Demonstration																															
Contract Award or Events	Prototype 1																															
	Prototype 2																															
Testing		Temp/ISP																														
		KTR																														
			GQT																													
			TRR																													
Development			SVR																													
Documentation				CPD																												
			IA																													

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						**DATE:** May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	**PROGRAM ELEMENT** PE 0603207N Air/Ocean Tactical Applications				**PROJECT NUMBER AND NAME** 2341 METOC Data Acquisition - Program: METMF (R) NEXGEN			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Acquisition Milestones								
System Development & Demonstration	1Q - 4Q							
Contract Award or Events								
Prototype 1	1Q - 4Q							
Prototype 2	1Q - 4Q							
Testing								
TEMP / ISP	2Q - 4Q							
KTR	2Q - 4Q							
GQT	4Q							
TRR	4Q							
Development								
SVR	4Q							
Documentation								
CPD	3Q - 4Q							
IA	3Q							

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																																
																															DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4					PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications												PROJECT NUMBER AND NAME 2341 METOC Data Acquisition - Program: Meteorlogical and Oceanographic (METOC) Future Mission Capabilities (FMC)															
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Database/Survey Development	→																															
Through-The-Sensor (TTS) Technologies	← TEP Development/Demonstration											→																				
	HWDDC →					← SPS-48G ROAR Integration																												

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	**PROGRAM ELEMENT** PE 0603207N Air/Ocean Tactical Applications				**PROJECT NUMBER AND NAME** 2341 METOC Data Acquisition - Program: Meteorological and Oceanographic (METOC) Future Mission Capabilities			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Database/Survey Development	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Through-The-Sensor (TTS) Technologies								
HWDDC								
Development & Demonstration	1Q - 4Q	1Q						
SPS-48G ROAR Integration		2Q - 4Q	1Q - 4Q					
TEP								
Development & Demonstration	1Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

CLASSIFICATION:

EXHIBIT R4, Schedule Profile

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition - Program: Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/NITES)

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Update Database Software for Transition to New Technology	▲		▲																													
Tactical Decision Aid (TDA) and Data Software Test and Integration		▲			▲																											
NITES TDA/Data Integration Efforts for Command and Control System Platforms	▲				▲			▲																								

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2341 METOC Data Acquisition - Program: Tactical Environmental Support System/Naval Integrated Tactical Environmental Subsystem (TESS/NITES)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Update Database Software for Transition to New Technology	1Q - 3Q							
Tactical Decision Aid (TDA) and Data Software Test and Integration	2Q - 4Q	1Q						
NITES TDA/Data Integration Efforts for Command and Control System Platforms	1Q - 4Q	1Q - 4Q						

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																															DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4									PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications														PROJECT NUMBER AND NAME 2341 METOC Data Acquisition - Program: Naval Integrated Tactical Environmental Subsystem (NITES) Next											
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Engineering Studies/Prototypes of Data Transport for Engineering & Development					Arch/Design Study/Eng																											
Design Development and Test of Data Storage in Netcentric Environment with NITES-Next													Net-centric METOC Data Support of DT&E																			

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2341 METOC Data Acquisition - Program: Naval Integrated Tactical Environmental Subsystem (NITES) Next			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Engineering Studies/Prototypes of Data Transport for Engineering & Development		1Q - 4Q						
Design Development and Test of Data Storage in Netcentric Environment with NITES-Next		1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2341 METOC Data Acquisition - Program: Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW)

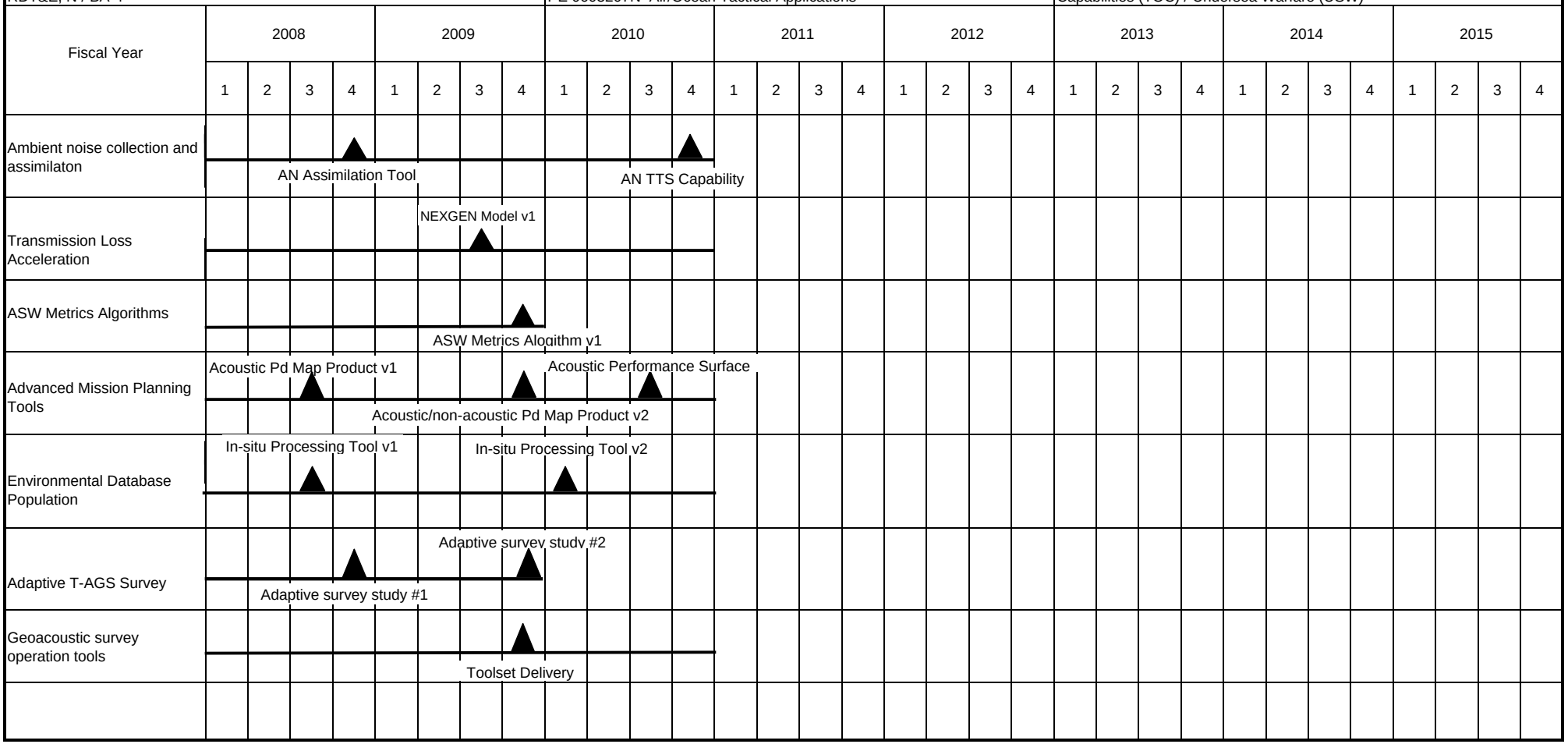

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2341 METOC Data Acquisition - Program: Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Ambient noise collection and assimilaton	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Transmission Loss Acceleration	1Q - 4Q	1Q - 4Q	1Q - 4Q					
ASW Metrics Algorithms	1Q - 4Q	1Q - 4Q						
Advanced Mission Planning Tools	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Environmental Database Population	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Adaptive T-AGS Survey	1Q - 4Q	1Q - 4Q						
Geoacoustic survey operation tools	1Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY
RDT&E, N / BA-4

PROGRAM ELEMENT NUMBER AND NAME
PE 0603207N Air/Ocean Tactical Applications

PROJECT NUMBER AND NAME
2341 METOC Data Acquisition - Program: Ocean Bottom Characterization Initiative (OBCI)

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Offboard Geoacoustic Survey System (OBCI)								AUV/Glider Behavior Mods ▲ T-AGS Glider Swarm Demo ▲																								
GAIT Version 3 Bottom Loss Algorithms (OBCI)							SOO OAML Delivery ▲ AN Inversion OAML Delivery ▲																									
Backscatter Database Development (OBCI)								Offboard Sensor Design ▲																								
Adaptive Sampling Geoacoustic Survey (OBCI)								DEM/VAL ▲																								

Note: Efforts rolled into the Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW) program.

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2341 METOC Data Acquisition - Program: Ocean Bottom Characterization Initiative (OBCI)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Offboard Geoacoustic Survey System (OBCI)								
AUV Glider Behavior Mods		4Q						
T-AGS Glider Swarm Demo		4Q						
GAIT Version 3 Bottom Loss Algorithms (OBCI)								
SOO OAML Delivery		3Q						
AN Inversion OAML Delivery		3Q						
Backscatter Database Development (OBCI)								
Offboard Sensor Design		4Q						
Adaptive Sampling Geoacoustic Survey (OBCI)								
DEM/VAL		4Q						

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**13.323**	**18.590**	**19.424**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The meteorological and oceanographic (METOC) Data Assimilation Project is a multi-faceted project that provides future mission capabilities for warfighters to characterize the physical environment within their battlespace. This project includes: 1) development, demonstration and validation of atmospheric and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in both mainframe and tactical scale computers. Included are numerical oceanographic and atmospheric models for the Large Scale Computers at the Navy Fleet Numerical Meteorology and Oceanography Center (FNMOC), Monterey, CA and the Naval Oceanographic Office (NAVO), Stennis Space Center, MS. These models, combined with a global communications network for data acquisition and distribution, form a prediction system which provides METOC data and products necessary to support naval operations worldwide in virtually every mission area; 2) other models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) techniques to process and manage satellite remotely-sensed environmental data at Oceanography Centers ashore and on ships equipped with the AN/SMQ-11 satellite receiver/recorder; 4) National Polar-orbiting Operational Environmental Satellite System (NPOESS) readiness and risk reduction preparations to develop hardware and software that will allow ground stations to receive, ingest and exploit NPOESS data including the NPOESS Preparatory Project (NPP). These techniques allow for the integration and tactical application of significant oceanographic and atmospheric data derived from satellite-borne sensors. Included are techniques and algorithms for the processing of sensor measurements, conversion of raw signal data to geophysical information, analysis schemes encompassing Artificial Intelligence and Expert Systems, and other satellite data applications and field validation of end products; and, 5) a family of acoustic system performance models beginning with active system models and databases in the low-, mid-, and high-frequency regimes and culminating with high fidelity simulation products. As weapons and sensors become more sophisticated and complex, the marine environment has an increasingly significant impact on system performance. Operational limitations induced by the ocean and atmosphere must be understood, and the resulting constraints on mission effectiveness and system employment minimized. Hence, the operating forces require more accurate worldwide forecasts of METOC conditions with increased temporal and spatial resolution. An additional challenge is posed by the emergence of new satellite sensor data. In order to fully exploit this dynamic and massive volume of data, modern Data Base Management Systems (DBMS) are required, and must be tailored for individual computer configurations at both FNMOC and NAVO. Improved representation of smaller-scale phenomena, particularly in the littoral, is also an important consideration. Intelligence Preparation of the Environment (IPE) Sensor R&D to meet CNO and Commander, Fleet Forces Command (CFFC) requirements for remote autonomous, clandestine, littoral battlespace sensing in near shore areas in support of Sea Shield & Sea Basing.

Funding increases in FY10 are in support of the Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities effort and reflect the need for additional data assimilation algorithms and applications resulting from the launch of the NPOESS Preparatory Project (NPP) satellite.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling	

(U) B. Accomplishments/Planned Program

Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	1.700	1.000	
RDT&E Articles Quantity				

FY09 - Continue, from FY07, the development of advanced data assimilation and fusion algorithms for glider and Autonomous Undersea Vehicles (AUVs) data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties. Demonstrate a basic capability to assimilate, database, and relay data and derived products from ocean gliders and AUVs, including optics, bathymetry, temperature, depth, salinity, and currents. Demonstrate prototype mission planning and adaptive sampling capability. Begin defining LBSF&I Unmanned Undersea Vehicle (UUV) Spiral 2.0 Fusion and Integration requirements and capabilities. Conduct Spiral 2 capability studies and analyses as required.

FY10 - Demonstrate a basic capability to assimilate, database, and relay data and derived products from ocean gliders, including optics (glider analysis, satellite coupling, NCOM integration, etc.), temperature, depth, salinity, and currents. Demonstrate prototype mission planning and adaptive sampling capability as part of the Littoral Battlespace Sensing - Gliders (LBS-G) System Development and Demonstration (SDD) phase. Continue development of advanced bathymetric data assimilation techniques such as Inertial Navigation Drift, automated fusion, micronavigation, and feature based navigation. Continue to define the LBS - Unmanned Undersea Vehicle (LBS-UUV) Spiral 2.0 Fusion requirements and capabilities. Integrate advanced quality control algorithms into the LBS-G system as required as part of the System Development and Demonstration (SDD) phase of the procurement. Complete at-sea and ashore Development Testing and Evaluation (DT&E) of the complete end-to-end glider system including command and control, mission planning, mission profile characteristics and other Key Performance Parameters (KPPs) and Key System Parameters (KSAs). Begin integration of advanced quality control algorithms into the LBS-AUV program as part of its SDD phase.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2342 METOC Data Assimilation and Modeling

(U) B. Accomplishments/Planned Program

Meteorlogical and Oceanographic (METOC) Future Mission Capabilities (FMC)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	10.529	9.968	9.132	
RDT&E Articles Quantity				

FY08 - Developed ASW Tactical Decision Aids (TDA) asset allocation and mission planning tools to optimize deployment of environmental data collection assets. Explored presentation of mission planning and acoustic reconstruction data in a Geographic Information System (GIS). Developed algorithms to create area acoustic assessments and analogous exercise area tools. Developed advanced data assimilation, coupled mesoscale forecast systems. Tested performance of 4D-Var (Degrees of Variation) for NAVDAS integration. Extended capabilities of assimilation systems to use additional satellite, remote sensed and insitu data types. Developed architecture for fully coupled ocean and atmospheric system. Continue to develop advanced atmospheric prediction/forecast models. Develop high resolution (small scale) atmospheric models to forecast environmental conditions in the littoral and riverine regions. Developed advanced global atmospheric prediction/forecast models. Developed high resolution (small scale) atmospheric models to nowcast & forecast environmental conditions in the littoral and riverine regions. Continued development of advanced aerosol small scale and large scale prediction models. Continued development of the Hazardous Weather Detection and Display Capability (HWDDC), the Tactical Environmental Processor (TEP) and associated advanced algorithms (e.g. Nowcast) that assimilate and fuse variou data types such as radial wind velocity, reflectivity, rain rate, etc. generated from the HWDDC system as well as data types such as electromagnetic refractivity generated from the SPY-1 TEP. Demonstrated the HWDDC system and associated fusion algorithms. Developed automated quality control algorithms for these data types. Began development of an end-to-end methodology to collect, fuse, and integrate these data into Navy and DoD networks and command and control nodes. Developed advanced data assimilation, coupled mesoscale forecast systems. Tested performance of 3D-Var for NCODA integration. Extended capabilities of assimilation systems to use additional satellite, remote sensed and insitu data types. Continued development of architecture for fully coupled ocean and atmospheric system. Continued to develop advanced ocean prediction/forecast models. Developed high resolution (small scale) atmospheric models to forecast environmental conditions in the littoral and riverine regions. Developed advanced global atmospheric prediction/forecast models. Developed high resolution (small scale) atmospheric models to nowcast & forecast environmental conditions in the littoral and riverine regions. Began development of data assimilation capability using EUMETSAT (European satellite) and NASA satellite data. Developed TDA uncertainty algorithms.

FY09 - Continue advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems. Continue development of advanced oceanographic ar atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Develop data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Develop atmospheric fusion algorithms and demonstrate TEP/HWDDC reachback fusion capability. Development of network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products into the SPY-1 Open Architecture and SPS-48G radars. Development of advanced data assimilation and data quality control algorithms for glider and Autonomous Undersea Vehicles (AUVs) data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties.

FY10 - Continue advanced component development and prototype efforts associated with advanced data assimilation into environmental prediction systems, to include development of tactical decision aids and asset allocation tools. Continue development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continue development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Develop data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Develop atmospheric fusion algorithms and demonstrate TEP reachback fusion capability. Development of network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Development of advanced data assimilation and data quality control algorithms for glider and Autonomous Undersea Vehicles (AUVs) data including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**	
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2342 METOC Data Assimilation and Modeling	

(U) B. Accomplishments/Planned Program

Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	3.612	5.851	
RDT&E Articles Quantity				

FY09 - Continue development of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) data assimilation algorithms and applications previously funded under PE 0305160N, Navy METOC Support (Space), Project 0524 using simulations and on-orbit heritage sensors. The NPOESS program constellation of satellites include the NPOESS Preparatory Project (NPP) satellite, the NPOESS satellites (C-1, C-2 and replacements) and the European METOP (European METeorological OPerational satellite program) .

FY10 - Continue development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Develop Naval applications using this data for Naval Meteorological and Oceanography (METOC) Production Centers. Funding increase reflects the need for additional data assimilation algorithms and applications resulting from the launch of the NPOESS Preparatory Project (NPP) satellite.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling

(U) B. Accomplishments/Planned Program

Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	2.794	3.310	3.441	
RDT&E Articles Quantity				

FY08 - Began development of an ASW mission planning tool for operational use at the ASW Reachback Cell (RBC) resident at the NAVOCEANO. Developed ASW Tactical Decision Aids (TDA) asset allocation and mission planning tools to optimize deployment of environmental data collection assets. Explored presentation of mission planning and acoustic reconstruction data in a Geographic Information System (GIS) Developed algorithms to create area acoustic assessments and analogous exercise area tools. Continued development of RAM. Increase computational speed of the model on ASW TDA processors. Created an OAML Model Testbed by archiving existing passive transmission loss active reverberation datasets. Made modification to the Comprehensive Acoustic System Simulation (CASS) Gaussian Ray Bundle (GRAB) to improve model performance. Began upgrade of NAUTILUS (a commercial product) propagation model to compute low frequency reverberation. Continued annual upgrades to the STAPLE system. Conducted Reverberation Modeling Workshop. Continued development of the SESSS algorithm. Continued to develop the Geophysical-Acoustic Bottom Interaction Model (GABIM) and GABIM-derived database. Began development of algorithms that recommend active sonar waveforms based on the state of the environment. Developed an algorithm that validates and improves the quality of modeled low frequency active planning. Continued development of the regional Ambient Noise Database (ANDB). Incorporated archived directional ambient noise time series observational data into the ANDB. Updated historical shipping databases with non-traditional vessel density data. Commenced development of a short-term ambient noise forecasting capability using previously collected ambient noise data from tactical sensors. Incorporated Adaptive Beam Forming (ABF) techniques into existing noise models. Developed methods to aid in the collection, archiving/databasing ambient noise data for later inclusion in historical databases supporting ASW TDAs. Developed TDA uncertainty algorithms.

FY09 - Continue development of ASW mission planning, analysis and reconstruction tools, including Geographic Information Systems (GIS), for operational use at the ASW Reachback Cell (RBC.) Reconstruction and Analysis (R&A) tool set will be expanded to support all ASW communities, integrate mission planning functions and contain both acoustic/non-acoustic reconstruction data in a GIS environment. Continue to develop ASW tactical decision aid (TDA) asset allocation and mission planning tools to optimize deployment of both environmental data collection assets and tactical acoustic and non-acoustic sensors. Develop ASW-related performance surface products for use at the NAVOCEANO ASW Reachback Cell and in mission planning systems to include Probability of Detection (Pd) maps. Assess uncertainty values associated with acoustic performance prediction products. Identify, develop and test environmentally-oriented, mathematically-based decision support tools for application in support of ASW operations and exercises. Begin development of models, databases and algorithms to quantify non-acoustic/acoustic uncertainty. Continue development of algorithms to create area acoustic assessments and analogous exercise area tools. Develop descriptive dynamic oceanography features assessment tool for ocean model accuracy/reliability determination. Establish a standardized environment for model and observation data. Continue spiral development of the RAM and Parabolic Equation acoustic models. Integrate upgrade NAUTILUS propagation model into fleet systems. Continue annual upgrades to the Scalable Tactical Acoustic Propagation Loss Engine (STAPLE) system. Continue development of SESSS. Develop a self-consistent semi-empirical surface loss model. Develop quantification algorithms for volume scattering. Continue development of the GABIM Version 2.0 and GABIM-derived database. Continue development of algorithms that recommend active sonar waveforms based on the state of the environment. Continue to make modification to the Comprehensive Acoustic System Simulation (CASS) Gaussian Ray Bundle (GRAB) to improve model performance in support of mission planning systems, tactical decision aids, fleet synthetic training systems and modeling and simulation tools. Upgrade the ASPM model to support IEER mission predictions. Use reverberation workshop results to develop new Navy Standard active reverberation model. Continue development of algorithms that recommend active sonar waveforms based on the state of the environment and algorithms that validate and improve the quality of modeled low frequency active planning. Develop electro-magnetic propagation and radiance models and refractive databases to support emerging non-acoustic ASW sensors. Develop models that quantify effects of near- surface turbulence and N-gradients on target detection. Develop Fish Scattering Strength (FSS) algorithm. Adapt existing acoustic models for better active localization. Improve realism in clutter modeling. Continue development of the regional ANDB Continue development of a short-term ambient noise forecasting capability using previously collected ambient noise data from tactical sensors. Continue to develop methods and techniques to aid in the collection, archiving/databasing and dissemination of both omni-directional and directional ambient noise data. Engineering design for NEXGEN ambient noise model, data assimilation and forecasting tool. Continue to develop TDA uncertainty algorithms. Develop ambient noise databases for emerging airborne and submarine-based ASW systems. Develop prototype P-3 AXBT data collection system. Develop improved bathythermograph (BT) data processing system for Master Oceanographic Observation Data Set (MOODS). Develop rapid mission reconstruction, analysis & feedback system. Provide project technical and program management oversight.

FY10 - Continue FY09 efforts. Continue to develop decision tool asset allocation and mission planning modules to optimize deployment of both environmental data collection assets and tactical Undersea Warfare (USW) acoustic and non-acoustic sensors. Continue to refine and validate USW-related performance assessment and decision products for use at the NAVOCEANO Antisubmarine Warfare (ASW) Reachback Cell (RBC) and in USW decision tools. Continue spiral development of active and passive acoustic propagation loss models for use in fleet mission planning systems supporting mono- and multistatic Antisubmarine Warfare operations. Continue technology upgrades to transmission loss acceleration algorithms. Develop algorithms that characterize acoustic reverberation and clutter as well as boundary and volume loss/scatter functions as observed by active and passive tactical sonar systems. Develop decision tool algorithms that optimize operational sonar system performance. Continue to develop directional and omnidirectional regional ambient noise characterization tools. Conduct technical demonstration of in-situ ocean parameter collection systems. Populate/upgrade oceanographic and acoustic databases in COCOM areas of interest. Transition algorithms that capture and communicate variability and uncertainty, robustness and sensitivity as input to Fleet USW decision tools and underlying models and data bases. Develop oceanographic operations analysis tools Develop real-time and post-event ASW performance assessment tools. Provide project technical and program management oversight.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
OPN 4226 METEOROLOGICAL EQUIPMENT	16.625	24.669	21.458					

RELATED RDT&E: PE 0604218N, Air/Ocean Equipment Engineering

(U) D. ACQUISITION STRATEGY:

Acquisition, management and contracting strategies to support the METOC Data Assimilation Project which is a multi-faceted program which includes: 1) development, demonstration and validation of atmospheric and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in both mainframe and tactical scale computers; 2) other models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) techniques to process and manage satellite remotely-sensed environmental data at Oceanography Centers ashore and on ships equipped with the AN/SMQ-11 satellite receiver/recorder; and, 4) a family of acoustic system performance models beginning with active system models and databases in the low-, mid-, and high-frequency regimes and culminating with high fidelity simulation products, all with management oversight by Program Executive Officer for Command, Control, Communications, Computers, and Intelligence (PEO C4I).

(U) E. MAJOR PERFORMERS:

Not applicable

(U) F. METRICS:

Earned Value Management (EVM) is used for metrics reporting and risk management.

Exhibit R-3 Cost Analysis (page 1)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development												
	WX	NRL	80.058	11.036	N/A	11.563	N/A					
	WX	SSCs	0.806	0.680	N/A	0.786	N/A					
	WX	MISC	3.547	1.020	N/A	1.179	N/A					
	CP	MISC	11.471	5.854	N/A	5.896	N/A					
	N/A	MISC	12.775									
	Grant	Univ. S. Miss.	2.413									
Subtotal Product Development			111.070	18.590	N/A	19.424	N/A					
Remarks:												
Support Costs												
	CP	SSA/CSC	0.295		N/A		N/A					
Subtotal Support Costs			0.295	0.000	N/A	0.000	N/A					
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 2342 METOC Data Assimilation and Modeling				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
Subtotal Management Services			0.000	0.000		0.000						
Remarks:												
Total Cost			111.365	18.590	N/A	19.424	N/A					

Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2342 METOC Data Assimilation - Program: Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV)

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LBSF&I UUV	Studies	AUV MS B			Spiral 1 AUV Sys Dev & Dem																											
			Glider MS B		Glider Sys Dev & Dem					Glider MS C		Glider IOC																				

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2342 METOC Data Assimilation - Program: Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
LBS-UUV								
Gliders								
Milestone B (MS B)	2Q							
System Development & Demonstration (SDD)	3Q - 4Q	1Q - 4Q	1Q - 2Q					
Milestone C (MS C)			2Q					
Initial Operating Capability (IOC)			4Q					
AUV								
Milestone B (MS B)	2Q							
System Development & Demonstration (SDD)	3Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																																
																															DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4					**PROGRAM ELEMENT NUMBER AND NAME** PE 0603207N Air/Ocean Tactical Applications												**PROJECT NUMBER AND NAME** 2342 METOC Data Assimilation and Modeling - Program: Meteorlogical and Oceanographic (METOC) Future Mission Capabilities (FMC)															
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Ocean Forecast Models Global	→	→	→	→	→	→	→	→	→	→	→	→																				
Ocean Forecast Models Regional	→	→	→	→	→	→	→	→	→	→	→	→																				
Ocean Forecast Models Littoral	→	→	→	→	→	→	→	→	→	→	→	→																				
Ocean Assimilation	→	→	→	→	→	→	→	→	→	→	→	→																				
Atmospheric Forcast Model Global	→	→	→	→	→	→	→	→	→	→	→	→																				
Atmospheric Mesoscale Forecast	→	→	→	→	→	→	→	→	→	→	→	→																				
Atmospheric Assimilation	→	→	→	→	→	→	→	→	→	→	→	→																				

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2342 METOC Data Assimilation and Modeling - Program: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Ocean Forecast Models Global	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Ocean Forecast Models Regional	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Ocean Forecast Models Littoral	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Ocean Assimilation	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Atmospheric Forecast Model Global	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Atmospheric Mesoscale Forecast	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Atmospheric Assimilation	1Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																																**DATE:** May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4					**PROGRAM ELEMENT NUMBER AND NAME** PE 0603207N Air/Ocean Tactical Applications												**PROJECT NUMBER AND NAME** 2342 METOC Data Assimilation and Modeling - Program: Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities																			
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NPOESS Preparatory Project (NPP) / National Polar-orbiting Operational Environmental Satellite System (NPOESS)					Data Assimilation Algorithm Development →							NPP Launch																						

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail								**DATE:** May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT**				**PROJECT NUMBER AND NAME**			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2342 METOC Data Assimilation and Modeling - Program: Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
NPOESS Preparatory Project (NPP) / National Polar-orbiting Operational Environmental Satellite System (NPOESS)								
Data Assimilation Algorithm Development		1Q - 4Q	1Q - 4Q					
NPP Launch			3Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY
RDT&E, N / BA-4

PROGRAM ELEMENT NUMBER AND NAME
PE 0603207N Air/Ocean Tactical Applications

PROJECT NUMBER AND NAME
2342 METOC Data Assimilation and Modeling - Program: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)

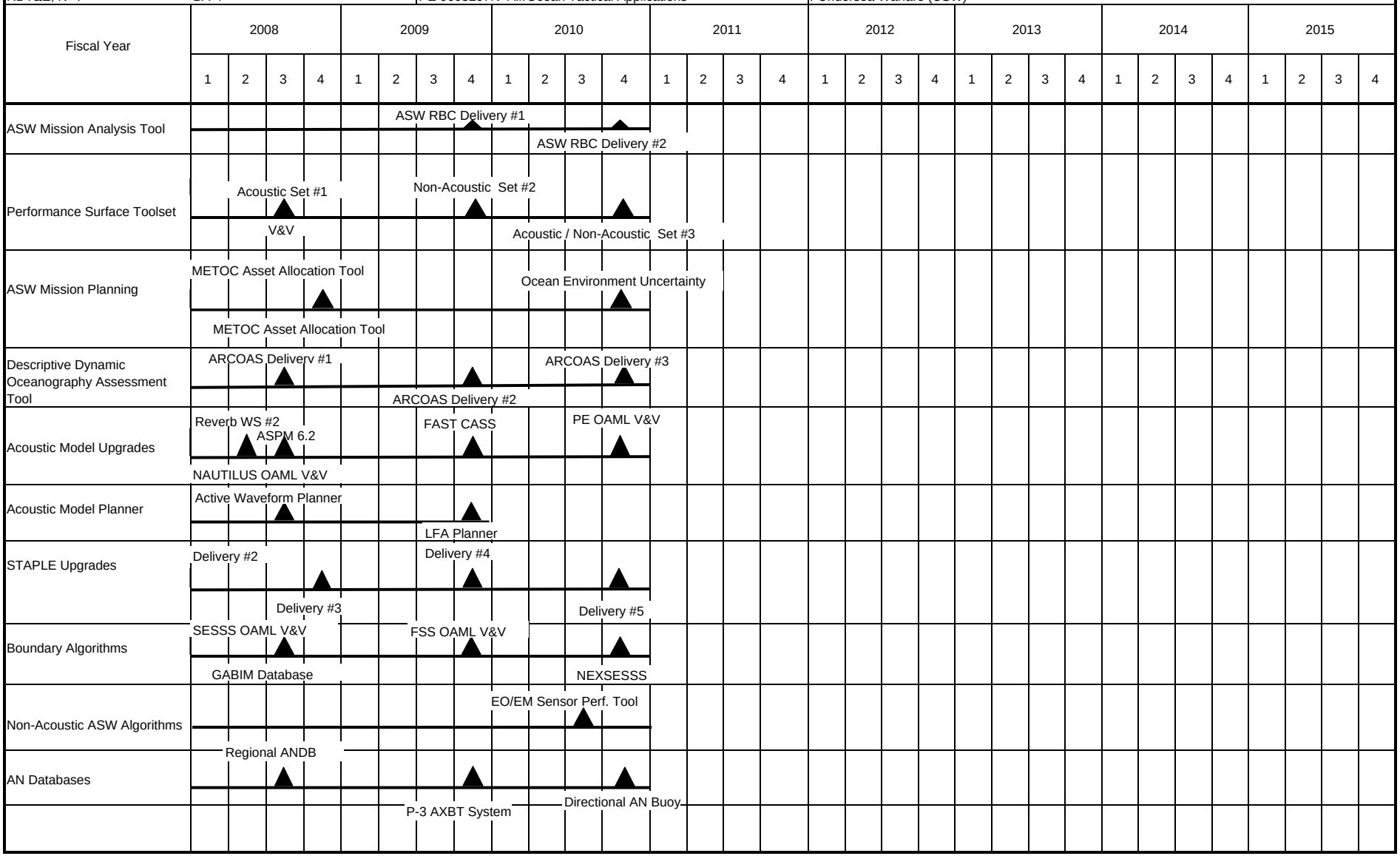


EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						**DATE:** May 2009		
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT**				**PROJECT NUMBER AND NAME**			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2342 METOC Data Assimilation and Modeling - Program: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
ASW Mission Analysis Tool	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Performance Surface Toolset	1Q - 4Q	1Q - 4Q	1Q - 4Q					
ASW Mission Planning	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Descriptive Dynamic Oceanography Assessment Tool	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Acoustic Model Upgrades	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Acoustic Model Planner	1Q - 4Q	1Q - 4Q						
STAPLE Upgrades	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Boundary Algorithms	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Non-Acoustic ASW Algorithms	1Q - 4Q	1Q - 4Q	1Q - 4Q					
AN Databases	1Q - 4Q	1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2343 Tactical METOC Applications			
COST ($ in Millions)	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Project Cost	**4.383**	**6.368**	**16.164**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Tactical Meteorological and oceanographic (METOC) Applications Project provides future operational effects decision aid capabilities for Navy and Marine Corps warfighters in the context of Joint Operations. This project identifies and transitions state-of-the-art decision support software technologies from the government's and commercial Industry's technology base and then demonstrates and validates these capabilities before fielding. These future software decision support tools are intended to provide platform, sensor, communications, and weapon systems performance assessments for warfighters in terms of their littoral and deep-strike battlespace environments. These assessments allow mission planners and warfighters, from the unit to theater level, to optimize their sensor employment on airborne, surface, and subsurface platforms in support of all Naval Composite Warfare mission areas including Undersea Warfare (USW), Anti-Submarine Warfare (ASW), Mine Warfare (MIW), Amphibious Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare (AAW), Strike Warfare (STW), and Naval Special Warfare (NSW). Performance assessments leading to improvements in operational and tactical control are conducted through a two-tiered approach: 1) METOC Decision Aids (MDAs) and, 2) Operational Effects Decision Aids (OEDAs). MDAs consist of a series of analysis tools which characterize the physical environment conditions of the battlespace based on the best set of physical environment data available at the time (i.e., some combination of historical and/or real-time (or near real-time) in-situ, and numerically modeled forecast data). OEDAs then use the MDA information by fusing it with relevant, often-classified sensor and target data to predict how own-force weapons and sensor systems will perform against hostile targets. Performance results are displayed in tabular and graphic formats for use by mission planners and combat/weapon system operators to develop localization plans, USW/AAW/ASUW screens, STW profiles, AMW ingress and egress points, and for other warfare considerations. MDAs and OEDAs typically use data derived from sensors developed in Project 2341 (METOC Data Acquisition) and assimilated by software produced by Project 2342 (METOC Data Assimilation and Modeling). MDAs and OEDAs also use data obtained through direct interfaces to Navy combat systems. A current emphasis area of the project is capabilities required to characterize and/or predict sensor and weapons system performance in the highly complex littoral environments in support of regional conflict scenarios. It addresses multi-warfare areas, particularly shallow water ASW, NSW, and missile and air defense/strike capabilities.

Funding increases, beginning in FY10, are the result of technical corrections to the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program's funding profile in order to more appropriately reflect the software only nature of the effort. The net result of these zero sum technical changes are reductions to the NITES-Next OP,N (BLI 4226 Meteorological Equipment) profile & subsequent dollar for dollar increases to the program's RDT&E,N profile.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2343 Tactical METOC Applications	

(U) B. Accomplishments/Planned Program

Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	4.383	6.368	15.888	
RDT&E Articles Quantity				

FY08 - Continued development of System architecture, system engineering, Preliminary Design Review (PDR), Critical Design Review (CDR), initial software development and Pre-Milestone C acquisition activities for NITES-Next (formerly NITES NG), including integration of updates to sensor data and backgrounds consistent with Joint Operations and development of upgrades to next generation Electromagnetic and Electro-optical (EM/EO) and Advanced Refractive Environmental Prediction System (AREPS) performance prediction systems to include incorporation of new Navy and Joint Sensor Suites. Developed the Mine Warfare and Environmental Data Applications Library (MEDAL) to include the incorporation of the new environmental databases and model updates . Supported transition in fleet for integration of new EM/EO Target Acquisition Weapons Software (TAWS), and advanced visualization techniques for Global Command and Control Systems integration prior to NITES-Next transition in FY08 to include integration of new EM/EO, TAWS, and advanced visualization techniques.

FY09 - Milestone C preparation activities and associated development of system architecture, system engineering, software development, test and integration activities for NITES-Next, including development of upgrades to next generation EM/EO and AREPS performance prediction systems. Extensive Developmental Test and Evaluation (DT&E) efforts in preparation for Initial Operational Test and Evaluation and Milestone C involving lab, fleet and site testing and early COMOPTEVFOR involvement. Develop MEDAL to include the incorporation of the new environmental databases and model updates.

FY10- Continue development of system architecture, system engineering, software development, test and integration activities for NITES-Next, including integration with to next generation EM/EO and performance prediction systems in support of Milestone C activities. Continue Developmental Test and Evaluation (DT&E) efforts in preparation for Initial Operational Test and Evaluation and Milestone C involving lab, fleet and site testing and early COMOPTEVFOR involvement. Complete the Critical Design Review (CDR) initiates extensive software development across the multiple Computer Software Configuration Items (CSCI).

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**	
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2343 Tactical METOC Applications	

(U) B. Accomplishments/Planned Program

Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.276	
RDT&E Articles Quantity				

FY08 - Efforts reported under the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program.

FY09 - Efforts reported under the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program.

FY10 - Continue capability upgrades and validation of Next Generation electro-magnetic and electro-optic (EM/EO) performance prediction systems and decision tools. Develop Through-the-Sensor (TTS) technologies to characterize atmospheric boundary layer parameters for ASW applications.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2343 Tactical METOC Applications

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Not applicable.

RELATED RDT&E: PE 0604218N (Air/Ocean Equipment Engineering).

(U) D. ACQUISITION STRATEGY:

Acquisition, management and contracting strategies are to support the Tactical METOC Applications project to continue the development of state-of-the-art software capabilities that provide sensor, communication, and weapon system performance assessments across the full spectrum of open ocean and littoral operating environments, meteorology and oceanography , all with management oversight incorporating these into Naval Integrated Tactical Environmental System Next Generation (NITES-Next) under JCIDS by Program Executive Officer for Command, Control, Communications, Computers, and Intelligence (PEO C4I).

(U) E. MAJOR PERFORMERS:

N/A

Exhibit R-3 Cost Analysis (page 1)												DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 2343 Tactical METOC Applications				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	WX	NRL	2.988	0.250	N/A	0.655	N/A					
	WX	SSCs	5.056	0.630	N/A	1.637	N/A					
	WX	MISC	3.302	0.758	N/A	1.965	N/A					
	CP	MISC	53.808	4.730	N/A	11.907	N/A					
	N/A	MISC	6.370									
Subtotal Product Development			71.524	6.368	N/A	16.164	N/A					
Remarks:												
Support Costs	CP	IPD	0.595		N/A		N/A					
Subtotal Support Costs			0.595	0.000	N/A	0.000	N/A					
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 2343 Tactical METOC Applications				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
Subtotal Management Services			0.000	0.000		0.000						
Remarks:												
Total Cost			72.119	6.368	N/A	16.164	N/A					

Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 2343 Tactical METOC Applications - Program: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	

Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition, Preparation & Major Milestones	Architecture & Prep for PDR, events toward MSC					PDR		CDR																								
Development Test and Refresh/Spirals									DT&E B(1)																							
TDA/Mission Planning Updates & Integration w/ NITES-Next	MEDAL Update TAWS EM Server				MEDAL Update TAWS/AREPS Platform Vulnerability				TAWS/AREPS																							

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						**DATE:** May 2009		
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT**				**PROJECT NUMBER AND NAME**			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2343 Tactical METOC Applications - Program: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Acquisition, Preparation & Major Milestones								
Preliminary Design Review (PDR)		2Q - 3Q						
Critical Design Review (CDR)		4Q						
Development Test and Refresh/Spirals								
DT&E B(1)		4Q	1Q - 4Q					
TDA Mission Planning Updates & Integration with NITES-Next								
MEDAL Update	1Q - 4Q	1Q - 4Q						
TAWS EM Server	1Q - 4Q							
TAWS / AREPS		1Q - 4Q	1Q - 4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R4, Schedule Profile																																DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4									PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications														PROJECT NUMBER AND NAME 2343 Tactical METOC Applications - Program: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)													
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Next Generation Electro-Magnetic and Electro-Optic (EM/EO) Performance Prediction Systems									EM/EO Capability Upgrade																							

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						**DATE:** May 2009		
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT**				**PROJECT NUMBER AND NAME**			
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications				2343 Tactical METOC Applications - Program: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Next Generation Electro-Magnetic and Electro-Optic (EM/EO) Performance Prediction Systems			**1Q - 4Q**					
Capability Upgrades			4Q					

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2344 Precise Timing and Astrometry			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**1.035**	**20.215**	**2.258**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The major thrust of the Precise Timing and Astrometry Project (PTA) is to provide future capabilities that directly support the mission of the U.S. Naval Observatory (USNO). These future mission capabilities are intended to:
1) address DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions (including objects at other than optical wavelengths) and the stellar inertial reference system (to which all navigation, guidance, and positioning systems are ultimately referred); 2) develop techniques for the prediction of the Earth's instantaneous orientation with respect to the stellar inertial reference system; 3) oversee the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks; and, 4) develop advanced electronic light detectors and interferometry in the optical and infrared wavelength regions for very precise determination of the positions of both faint and bright stars, satellite tracking, and space debris studies. DoD Instruction 5000.2 assigns to the Navy the responsibility for coordinating Precise Time and Time Interval (PTTI) requirements and for maintaining a PTTI reference standard (astronomical and atomic) for use by all DoD Services, Federal agencies, and related scientific laboratories. The Navy is also responsible for providing astronomical data for navigation, positioning, and guidance, including space. Some operational and many emerging requirements surpass current support capabilities. In response to these DoD requirements, this project transitions Research (6.1) and Exploratory Development (6.2) efforts, as well as developments in the civilian sector, into the operational capabilities of the USNO.

Joint Milli-Arcsecond Pathfinder Survey (J-MAPS). Joint strike operations require extremely accurate Positioning, Navigation, and Timing (PNT) systems in order to both: locate hostile threats with space-borne Intelligence Surveillance and Reconnaissance (ISR) systems, and then to deliver ordnance on precisely selected targets. The U.S. Navy, via the U.S. Naval Observatory (USNO), provides a key component of PNT – the Celestial Reference Frame. This reference frame is defined in star catalogs that are used in conjunction with star trackers to determine orientation of space-based sensors to minimize Target Location Error (TLE) and the resultant weapon system Circular Error Probable (CEP). The accuracy of star positions (hence obtainable CEP and TLE) is degrading with time due to the movement of stars since the last highly accurate space-based measurements of star positions (order of 1 milli-arcsecond) were made in 1991 (Hipparcos star catalog). The accuracy of the catalog is approaching the minimum necessary to support current requirements, and will not meet future needs for high accuracy sensors and weapon systems. Therefore, USNO, in concert with other activities and agencies in the Space and ISR communities, has developed the J-MAPS initiative. The J-MAPS initiative will satisfy the emerging requirements for a new high accuracy star catalog through a space-based astrometry mission that will also “pathfind” new star tracker technology as a risk reduction for future ISR systems. Producing star catalogs with sufficient accuracy to meet these requirements can only be done from space platforms (satellites) due to atmospheric interference on ground-based systems and the physical limitations of high atmospheric aircraft.

Beginning in FY10 the resources for the J-MAPS program are budgeted in project 3229.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2344 Precise Timing and Astrometry

(U) B. Accomplishments/Planned Program

Precise Timing & Astrometry	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	1.035	1.215	2.258	
RDT&E Articles Quantity				

FY08 - Completed development of algorithm for ensemble clock system. 24/7 demonstration of two fountain ensemble clock. Mod M-code GPS receiver to meet final specifications.

FY09 - Operational Readiness Review (ORR) for Rubidium (Rb) Fountain at USNO. Installation and testing for three Rb fountain systems. Continue fabrication of four Rb Fountain Systems . Demo GPS Military (M) Code tracking for Timing Receivers.

FY10 - Complete fabrication of four Rb Fountain systems; complete installation and testing of Alternate Master Clock (AMC) Fountain systems. Complete contract preparation and award for unique capabilities GPS M Code Timing Receiver.

Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	19.000	0.000	
RDT&E Articles Quantity				

FY09 - Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) will be used to complete Phase A (conceptual design) and Phase B (preliminary design) of the overall spacecraft and mission. In addition, long lead item developments will begin immediately after the System Requirements Review (SRR). Developments will include focal plane assemblies, readout and processing electronics, and optical components. By the end of FY09, as a result of this funding, a preliminary design for the spacecraft will be delivered.
Note: Beginning in FY10 the resources for the J-MAPS program are budgeted in project 3229.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	2344 Precise Timing and Astrometry

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Not applicable.

(U) D. ACQUISITION STRATEGY:

Acquisition, management and contracting strategies are to support the Precise Timing and Astrometry Project in direct support of the U.S. Naval Observatory (USNO) in: 1) addressing DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions and the stellar inertial reference system ; 2) developing techniques for the prediction of the Earth's instantaneous orientation with respect to the stellar inertial reference system; 3) overseeing the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks; and, 4) developing advanced electronic light detectors and interferometry in the optical and infrare wavelength regions for very precise determination of the positions of both faint and bright stars, satellite tracking, and space debris studies, all with management oversight by Program Executive Officer for Command, Control, Communications, Computers, and Intelligence (PEO C4I).

(U) E. MAJOR PERFORMERS:

N/A

Exhibit R-3 Cost Analysis (page 1)												DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 2344 Precise Timing and Astrometry				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	WX	Naval Observatory	12.932	1.215	N/A	2.258	N/A					
	N/A	MISC	0.438		N/A		N/A					
	TBD	TBD		19.000								
Subtotal Product Development			13.370	20.215	N/A	2.258	N/A					
Remarks:												
Support Costs												
Subtotal Support Costs			0.000	0.000		0.000						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 2344 Precise Timing and Astrometry				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
Subtotal Management Services			0.000	0.000		0.000						
Remarks:												
Total Cost			13.370	20.215	N/A	2.258	N/A					

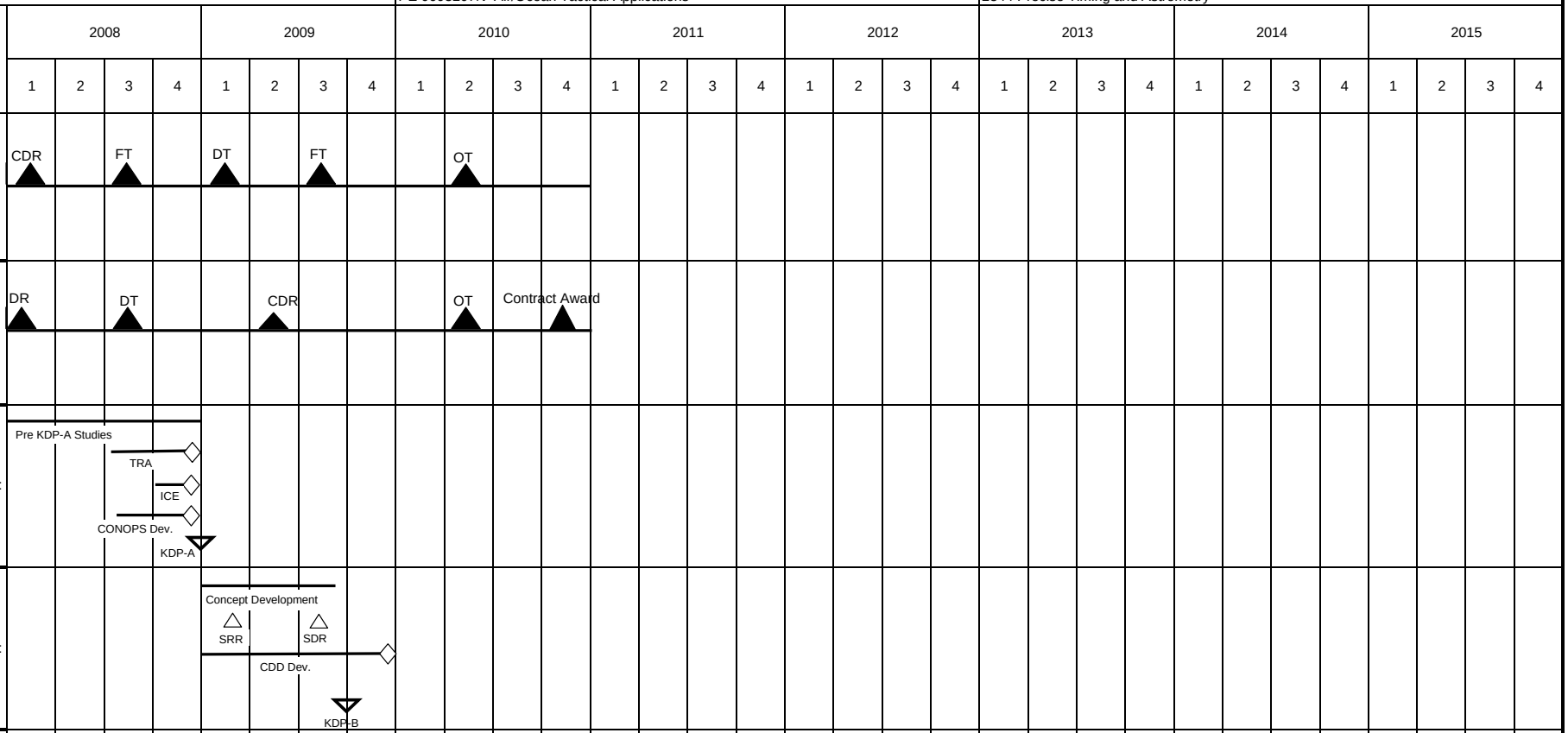
Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY
RDT&E, N / BA-4

PROGRAM ELEMENT NUMBER AND NAME
PE 0603207N Air/Ocean Tactical Applications

PROJECT NUMBER AND NAME
2344 Precise Timing and Astrometry



FY08 Efforts of the Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) program funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase.

PDR = Preliminary Design Review, DR = Design Review, DT = Development Test, CDR = Critical Design Review, OT = Operational Test, FT = Functional Test, IOC = Initial Operating Capability, FOC = Full Operational Capability, SRR = System Requirements Review

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 2344 Precise Timing and Astrometry			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Rubidium Beam (Rb) Master Clock	1Q - 4Q	1Q - 4Q	1Q - 4Q					
CDR	1Q							
FT	3Q	3Q						
DT	1Q							
OT			2Q					
GPS M-Code Receiver								
DR	1Q							
DT	3Q							
CDR		2Q						
OT			2Q					
Contract Award			4Q					
Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)								
Pre-Phase A Development								
Pre - Key Decision Pont A Studies	1Q - 4Q							
Technical Readiness Assessment (TRA)	3Q - 4Q							
CONOPS Development	3Q - 4Q							
Independent Cost Estimate (ICE)	4Q							
Key Decision Point A	4Q							
Phase A Development								
Concept Development		1Q - 3Q						
System Requirements Review (SRR)		1Q						
System Design Review (SDR)		3Q						
Capability Development Document (CDD) Development		1Q - 4Q						
Key Decision Point B		3Q - 4Q						

FY08 Efforts of the Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) program funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase.

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**0.000**	**0.997**	**1.008**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Fleet Synthetic Training (FST) is a CNO initiative that is intended to provide naval forces with an enhanced in-port training capability. Integrating embedded shipboard training devices, aircraft and submarine simulators into an interoperable network with Joint, Coalition and Interagency partners is expected to provide more effective training for our deploying naval forces.

A key factor in achieving this new way of training our naval forces is to ensure that the required training is based on realistic characterizations of the physical environment. This project is intended to develop and deliver software that characterizes the ocean and atmospheric environments; adjusts to meet Fleet-required training scenarios; allows synthetic training to be conducted in areas of planned and contingency operations; and, provides sufficient detail to simulate the real-world conditions of the physical environment in those areas of interest.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**	
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	3207 Fleet Synthetic Training	

(U) B. Accomplishments/Planned Program

Fleet Synthetic Training (FST)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	0.997	1.008	
RDT&E Articles Quantity				

FY09 - Begin to develop software that provides a common ocean and atmospheric environment to the federation of systems within the Fleet Synthetic Training compliant High Level Architecture. Start to enhance underwater acoustic propagation model and database software that is required to stimulate active sonar displays aboard ships. Start to develop software that is required to connect the sensor performance surface to the federation of Fleet Synthetic trainers. Initiate software development of land mass effects (e.g., island effects) on ocean and atmospheric environments.

FY10 - Begin to field software that provides a common ocean and atmospheric environment to the federation of systems within the Fleet Synthetic Training compliant High Level Architecture. Start to implement software that is required to connect the sensor performance surface to the federation of Fleet Synthetic trainers. Continue software development of land mass effects (e.g., island effects) on ocean and atmospheric environments. Begin testing enhanced underwater acoustic propagation model and database software that is required to stimulate active sonar displays aboard ships. Begin to assess the effectiveness of these upgrades in addressing the question of how much fidelity is required within the models in order for the Fleet to be able to realize training in-port that's equivalent in effectiveness to training at-sea.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Not Applicable

RELATED RDT&E:

(U) D. ACQUISITION STRATEGY:

(U) E. MAJOR PERFORMERS:

Not applicable

(U) F. METRICS:

EXHIBIT R-2a, RDT&E Project Justification

Exhibit R-3 Cost Analysis (page 1)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	WX	Naval Oceanographic Office -		0.600	N/A	0.610	N/A					
		Stennis Space Center, MS										
	CP	Applied Research Laboratory -		0.397	N/A	0.398	N/A					
		University of Texas										
Subtotal Product Development			0.000	0.997	N/A	1.008	N/A					
Remarks:												
Support Costs												
Subtotal Support Costs			0.000	0.000		0.000						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4		PROGRAM ELEMENT 0603207N Air/Ocean Tactical Applications						PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation					N/A		N/A					
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
Subtotal Management Services			0.000	0.000		0.000						
Remarks:												
Total Cost			0.000	0.997	N/A	1.008	N/A					

Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile																																
																															DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4									PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications												PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training											
Fiscal Year	2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Software/Product Development for Realistic Sybthetic Environment					▲				▲																							
Acoustic Model & Database Enhancements for SQS-53c Active Sonar Displays						▲				▲																						
Software/Product Development to Connect the Sensor Performance Surface to the Federation of Trainers					▲				▲																							

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 3207 Fleet Synthetic Training			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Software/Product development for Realistic Synthetic Environment		1Q	1Q					
Acoustic Model & Database Enhancements for SQS-53c Active Sonar		2Q	2Q					
Displays								
Software/Product development to connect the Sensor Performance		1Q	1Q					
Surface to the Federation of trainers								

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications				PROJECT NUMBER AND NAME 3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**0.000**	**0.000**	**55.200**					
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) satellite program. Joint strike operations require extremely accurate Positioning, Navigation, and Timing (PNT) systems in order to both: locate hostile threats with space-borne Intelligence Surveillance and Reconnaissance (ISR) systems, and then to deliver ordnance on precisely selected targets. The U.S. Navy, via the U.S. Naval Observatory (USNO), provides a key component of PNT – the Celestial Reference Frame. This reference frame is defined in star catalogs that are used in conjunction with star trackers to determine orientation of space-based sensors to minimize Target Location Error (TLE) and the resultant weapon system Circular Error Probable (CEP). The accuracy of star positions (hence obtainable CEP and TLE) is degrading with time due to the movement of stars since the last highly accurate space-based measurements of star positions (order of 1 milli-arcsecond) were made in 1991 (Hipparcos star catalog). The accuracy of the catalog is approaching the minimum necessary to support current requirements, and will not meet future needs for high accuracy sensors and weapon systems. Therefore, USNO, in concert with other activities and agencies in the Space and ISR communities, has developed the J-MAPS initiative. The J-MAPS initiative will satisfy the emerging requirements for a new high accuracy star catalog through a space-based astrometry mission that will also “pathfind” new star tracker technology as a risk reduction for future ISR systems. Producing star catalogs with sufficient accuracy to meet these requirements can only be done from space platforms (satellites) due to atmospheric interference on ground-based systems and the physical limitations of high atmospheric aircraft.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)	

(U) B. Accomplishments/Planned Program

Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	0.000	55.200	
RDT&E Articles Quantity				

FY08 - Efforts funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase.

FY09 - Efforts funded in project 2344 (Precise Timing and Astrometry) for concept development.

FY10 - Efforts budgeted in project 3229 (Joint Milli-Arcsecond Pathfinder Survey) is for Phase B preliminary design and Phase C complete design.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	**PROGRAM ELEMENT NUMBER AND NAME**	**PROJECT NUMBER AND NAME**
RDT&E, N / BA-4	PE 0603207N Air/Ocean Tactical Applications	3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

FY08 - Efforts funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase.

FY09 - Efforts funded in project 2344 (Precise Timing and Astrometry) for concept development.

(U) D. ACQUISITION STRATEGY:

The JMAPS program will not be developed as an Evolutionary Acquisition (EA). JMAPS will be acquired as an S&T government activity through NRL and USNO. ONR will utilize the contract mechanism at NRL and USNO to support the development of the program. JMAPS will be executed as a class B/C program in accordance with Military handbook DOD-HDBK-343 (USAF) of 01 February 1986, *Design Construction and Testing Requirements for One of a Kind Space Equipment*. Additionally, JMAPS will adhere to the Key Decision Point and gates established for acquisition programs. Complete traceability will be limited to only the key requirements and technology below TRL 6 at ATP will be acceptable by providing risk mitigation strategies and maintain alternate implementations.

(U) E. MAJOR PERFORMERS:

The major performers for JMAPS is NRL for the spacecraft and instrument and USNO for the performance expertise and catalogue generation. Funding will be provided to these organizations through work request and direct cite funding documents. The Air Force Research Laboratory supports the development of the spacecraft bus. Funding to AFRL will be through a MIPR. Additionally management support to the program office is provided by an ONR support contract.

Exhibit R-3 Cost Analysis (page 1)												DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development			0.000	0.000	N/A							
Preliminary Design Review (PDR) & Critical Design Review (CDR)	FM	Naval Research Laboratory (NRL), Washington DC				49.400	Oct-09					
Subtotal Product Development			0.000	0.000	N/A	49.400	N/A					
Remarks:												
Support Costs												
Requirements and Performance analysis	FM	USNO, Washington DC				5.200	Oct-09					
Subtotal Support Costs			0.000	0.000		5.200						
Remarks:												

Exhibit R-3 Cost Analysis (page 1)

Exhibit R-3 Cost Analysis (page 2)									DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4			PROGRAM ELEMENT PE 0603207N Air/Ocean Tactical Applications					PROJECT NUMBER AND NAME 3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test & Evaluation												
Subtotal Test & Evaluation			0.000	0.000		0.000						
Remarks:												
Management Services												
Program office support	Contract	ONR- Arlington, VA				0.600	Oct-09					
Subtotal Management Services			0.000	0.000		0.600						
Remarks:												
Total Cost			0.000	0.000	N/A	55.200	N/A					

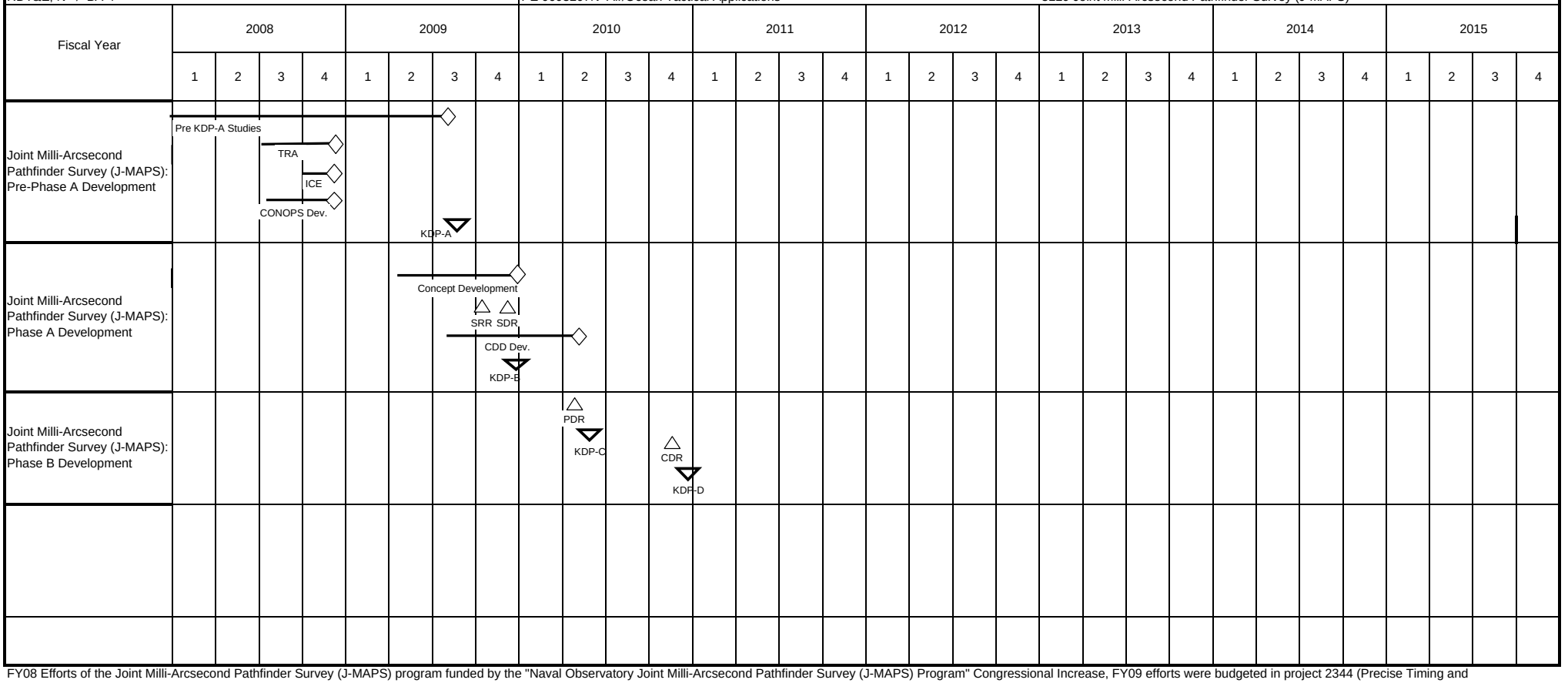
Exhibit R-3 Cost Analysis (page 2)

EXHIBIT R4, Schedule Profile | **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY
RDT&E, N / BA-4

PROGRAM ELEMENT NUMBER AND NAME
PE 0603207N Air/Ocean Tactical Applications

PROJECT NUMBER AND NAME
3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)



FY08 Efforts of the Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) program funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase, FY09 efforts were budgeted in project 2344 (Precise Timing and

PDR = Preliminary Design Review, DR = Design Review, DT = Development Test, CDR = Critical Design Review, OT = Operational Test, FT = Functional Test, IOC = Initial Operating Capability, FOC = Full Operational Capability, SRR = System Requirements Review

EXHIBIT R4, Schedule Profile

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	**PROGRAM ELEMENT** PE 0603207N Air/Ocean Tactical Applications				**PROJECT NUMBER AND NAME** 3229 Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Joint Milli-Arcsecond Pathfinder Survey (J-MAPS)								
Pre-Phase A Development								
Pre - Key Decision Pont A Studies	1Q - 4Q							
Technical Readiness Assessment (TRA)	3Q - 4Q							
CONOPS Development	3Q - 4Q							
Independent Cost Estimate (ICE)	4Q							
Key Decision Point A		3Q						
Phase A Development								
Concept Development		2Q - 4Q						
System Requirements Review (SRR)		4Q						
System Design Review (SDR)		4Q						
Capability Development Document (CDD) Development		3Q - 4Q	1Q - 2Q					
Key Decision Point B		4Q						
Phase B Development								
Preliminary Design Review			2Q					
Key Decision Point C			2Q					
Phase C Development								
Critical Design Review			4Q					
Key Decision Point D			4Q					

FY08 Efforts of the Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) program funded by the "Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program" Congressional Increase, FY09 efforts were budgeted in project 2344 (Precise Timing and Astrometry).

Exhibit R-4a, Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-4	PROGRAM ELEMENT NUMBER AND NAME PE 0603207N Air/Ocean Tactical Applications	PROJECT NUMBER AND NAME 9999 Congressional Increases	

(U) B. Accomplishments/Planned Program

9891 Gateway Concept	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	1.546	0.000	0.000	
RDT&E Articles Quantity				

FY08 - Continued the development of a new design for underwater cable connections.

9999 Semi-Submersible UUV	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.967	1.596	0.000	
RDT&E Articles Quantity				

FY08 - Began design and development efforts for a Semi-Submersible Unmanned Underwater Vehicle (UUV)

FY09 - Continue the design and development efforts for a Semi-Submersible Unmanned Underwater Vehicle (UUV)

9999 Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	3.891	0.000	0.000	
RDT&E Articles Quantity				

FY08 - Began system engineering and technology development efforts, to include the development of the focal plane array, for the Naval Observatory Joint Milli-Arcsecond Pathfinder Survey (J-MAPS) Program.

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4						R-1 ITEM NOMENCLATURE 0603216N, AVIATION SURVIVABILITY		
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total			
Total PE Cost	21.302	13.624	6.505	8.000	14.505			
0584 ACFT PROTECTIVE CLOTHING	2.369	1.957	2.507		2.507			
0591 ACFT SURVIVABILITY, VULNERABILITY	1.538	1.596	1.619	8.000	9.619			
0592 ACFT & ORDNANCE SAFETY	1.529	1.566	1.630		1.630			
1819 CV ACFT FIRE SUPPRESSION	.688	.727	.749		.749			
9999 CONGRESSIONAL ADDS	15.178	7.778						

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

B. PROGRAM CHANGE SUMMARY

Funding:	FY 2008	FY 2009	FY 2010	FY2010 OCO
President's Budget	21.625	5.917	6.576	0.000
Current BES	21.302	13.624	6.505	8.000
Total Adjustments	-0.323	7.707	-0.071	8.000
Summary of Adjustments				
Congressional Rescissions				
Congressional Adjustments		7.744		
SBIR/STTR/FTT Assessments	-0.311			
Program Adjustments			0.003	
Rate/Misc Adjustments	-0.013	-0.037	-0.074	
OCO Adjustment				8.000
Subtotal	-0.324	7.707	-0.071	8.000

Schedule: Project 0584: Advance Helmet Vision Systems - ongoing development of Super Extended Graphic Array (SXGA) and higher Ultra Extended Graphic Array (UXGA) resolution day/night cameras will be integrated. Injury Prevention - results of injury prevention research will be integrated into protective equipment design and testing. AHVS Laboratory testing - Laboratory testing of the unity mag goggles complete and laboratory characterization of unity mag goggle design III is underway,

Project 0592: Air to Air - Technology to address IM shortfalls in air to air weapons such as Sidewinder & AAMRAM. Technology is being demonstrated that will transistion to a new Sidewinder warhead early in the design phase. Shock/Blast Barrier - Demonstration of new shock/blast barrier technology that will also mitigate bullet/fragment penetration. Additionally, Harpoon has a potential window of opportunity to mitigate SD of the AGM-84. Technology demonstration of a container design incorporating pumice barriers will reduce the risk/cost of transition to the program. Improved Air Launched Weapons - demonstrate Improved Air Launched munitions for force protection and Homeland Defense.

Project 0591 - Scan Eagle Capability Improvements: Develop Internet Protocol(IP)-based architecture for integrating over-the-horizon capable Scan Eagle control from Subsurface-Guided Nuclear Submarine (SSGN) using two unmanned aerial systems (UAS's) for command-and-control relay . Provides technology development and engineering for point-specific intelligence, surveillance, and reconnaissance transitionin from maritime to land environments. Scan Eagle will advance available communication technology and data relay for UAS's currently in use and provide linkage opportunities to other services.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 0584, ACFT PROTECTIVE CLOTHING			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**2.369**	**1.957**	**2.507**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Project 0584 develops, demonstrates, and validates technologies designed to enhance warfighter performance, protection, mission effectiveness, and survivability. The project addresses life support equipment, advanced helmet vision systems, escape systems technology, crew centered cockpit design, and control stations. It responds to a number of operational requirements documents, including OR# 210-05-88 for Chemical and Biological (CB) protection, OR# 099-05-087 for Laser Eye Protection, and the joint Air Force/Navy (CAF-208-93) for an Aerospace Control Helmet Mounted Cueing System.

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0584, ACFT PROTECTIVE CLOTHING

B. Accomplishments/Planned Program

Advanced Technology Crew Station	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.250	1.170	1.465	
RDT&E Articles Quantity				

Advanced Technology Crew Station (ATCS): System integration and flight testing of Advanced Helmet Vision System enhanced resolution Advanced Helmet Vision System (AHVS) 12/Thermal mode control studies. Pilot Vehicle Interface (PVI) common symbology designed and tested. Advanced Technology Escape System (ATES) ejection seat trajectory and crashworthy seat stroke models with biodynamic models exploring various integrated aircrew head/neck protection configurations for ejection safe helmet mounted systems. Incorporate computational fluid dynamics, parachute models, and testing. Preliminary ergonomic seating design, validated BioRID performance and mature final version. Incorporate models of helmet mounted displays into the PVI to support testing and validation of on board/off board data correlation. Horizontal accelerator/vibrating platform assessment of the Parachute Opening Shock Emmulator (POSE). Development of SXGA and higher (UXGA) resolution CCD (Charge Coupled Device) day / night vision cameras for integration into the Advanced Helmet Vision System. Integrate results of injury prevention research into protective equipment design and testing to include helmet mounted devices and into ejection seat design for improved seal performance, retention, and safety. Development and testing of side facing seat and improved restraint system. Focus on shock and vibration work.

Advanced Integrated Life Support System	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.119	.787	1.042	
RDT&E Articles Quantity				

Advanced Integrated Life Support System (AILSS): Conduct design analyses to integrate the frequency Agile Unity magnification goggles (laser eye protection) into the Advanced Helme Mounted Display. Laboratory testing of the unity mag goggles is complete. Laboratory characterization of unity mag goggle design III is underway, integration studies have begun. Focus on optical design to maximize performance. Integrate Smart Advanced Integrated Life Support System (SAILSS) with on-board oxygen and personal air conditioning systems. Microclimate cooling designed and tested, miniaturization underway.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0584, ACFT PROTECTIVE CLOTHING

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
NOT APPLICABLE			

D. ACQUISITION STRATEGY:

NOT APPLICABLE

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY			PROJECT NUMBER AND NAME 0584, ACFT PROTECTIVE CLOTHING						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	VARIOUS	VARIOUS	3.220	0.632	01/09	0.929	01/10					
Systems Engineering	WR	NAVAIR, Patuxent River MD	26.868	0.515	12/08	0.618	12/09					
Systems Engineering	VARIOUS	VARIOUS	13.900									
Licenses	VARIOUS	VARIOUS	0.540	0.180	12/08	0.180	12/09					
Subtotal Product Development			44.528	1.327		1.727						
Remarks:												
Configuration Management	WR	NAVAIR, Patuxent River MD	0.532			0.210	12/09					
Configuration Management	VARIOUS	VARIOUS	3.232									
Subtotal Support			3.764			0.210						

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY			PROJECT NUMBER AND NAME 0584, ACFT PROTECTIVE CLOTHING						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	WR	NAVAIR, Patuxent River MD	1.418	0.200	12/08	0.310	12/09					
Developmental Test & Evaluation	VARIOUS	VARIOUS	18.240									
Subtotal T&E			19.658	0.200		0.310						
Remarks:												
Program Management Support	WR	NAWCAD, Patuxent River MD	1.200	0.380	12/08	0.210	12/09					
Travel	TO	NAVAIR, Patuxent River MD	0.235	0.050	10/08	0.050	10/09					
Subtotal Management			1.435	0.430		0.260						
Remarks:												
Total Cost			69.385	1.957		2.507						
Remarks:												

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /** **BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY	PROJECT NUMBER AND NAME 0584, ACFT PROTECTIVE CLOTHING	

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Program Milestone												
Agile Laser Eye Protection												
Intensified Unity Mag Goggle												
Advance Helmet Vision Systems												
Advanced Integrated Life Support System (AILSS)												
Injury Prevention												
Test & Evaluation Milestones												
AHVS Laboratory testing												
Advanced Technology Crew Station (ATCS)												
Production Deliveries												

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N / BA-4**	PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 0584, ACFT PROTECTIVE CLOTHING			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Advanced Technology Crew Station (ATCS)	1Q-4Q	1Q-4Q	1Q-4Q					
Agile Laser Eye Protection	1Q-4Q	1Q-2Q						
Intensified Unity Mag Goggle	1Q-4Q	1Q-2Q						
Advanced Helmet Vision System (AHVS)	1Q-4Q	1Q-4Q	1Q-4Q					
Advanced Integrated Life Support System (AILSS	1Q-4Q	1Q-4Q	1Q-4Q					
Injury Prevention	1Q-4Q	1Q-4Q	1Q-4Q					
AHVS Laboratory Testing	1Q-4Q	1Q-4Q	1Q-4Q					

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 TOTAL			
Project Cost	**1.538**	**1.596**	**1.619**	**8.000**	**9.619**			
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Aircraft Survivability, Vulnerability and Safety. This project develops prototype hardware to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of fire and explosion suppression techniques for fuel systems.

R-1 SHOPPING LIST - Item No. 27

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY

B. Accomplishments/Planned Program

TECHNOLOGY REQUIREMENTS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	.150	.160	.282	
RDT&E Articles Quantity				

Technology Requirements: Determine future survivability technology requirements through trade studies that result in program master plans or specific system improvement plans. Data gathering and analysis that determines specific survivability improvements for a platform or platform types. Technology reviews that determine current state of survivability technology development for USN, USMC, US Army, US Air Force, and industry. Trade studies include transport aircraft infrared signature analysis, rotary wing survivability requirements, advanced threat assessments, and methodology improvements. Support the program manager by performing survivability related systems engineering support.

TECHNOLOGY DESIGN & DEVELOPMENT	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	.988	.939	.954	
RDT&E Articles Quantity				

Technology Design & Development: Design of susceptibility and/or vulnerability reduction prototype hardware. Fabrication and integration/installation of prototype hardware in mockups, aircraft, test fixtures, or as part of larger subsystems. Prototype hardware includes fire and fuel protection systems, transparent and opaque armors, exhaust suppressors, counter-asymmetric threat hardware.

TECHNOLOGY TEST & EVALUATION	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	.400	.497	.383	
RDT&E Articles Quantity				

Technology Test & Evaluation: Integration, laboratory, ground, and flight tests of prototype hardware. Includes ballistic testing of coupons, samples, and production representative hardware Radio frequency, Infrared, visual, and acoustic signature measurements of components and fully installed systems. Testing of hardware uses surrogate or real threats or threat systems at major range and test facilities. All tests are designed to demonstrate prototype's technology readiness level indicating maturity level and ability to transition to production (through engineerin change proposal (ECP) or spiral development).

ARCHITECTURE DEVELOPMENT	FY 08	FY 09	FY 10	FY 10 OCO
Accomplishments/Effort/Subtotal Cost				8.000
RDT&E Articles Quantity				

Scan Eagle Capability Improvements: Develop Internet Protocol (IP)-based architecture for integrating over-the-horizon capable Scan Eagle control from Subsurface-Guided Nuclear Submarine (SSGN) using two unmanned aerial systems (UAS's) for command-and-control relay . Provides technology development and engineering for point-specific intelligence, surveillance, and reconnaissance transitioning from maritime to land environments. Scan Eagle will advance available communication technology and data relay for UAS's currently in use and provide linkage opportunities to other services.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

NOT APPLICABLE

D. ACQUISITION STRATEGY:

NOT APPLICABLE

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY			PROJECT NUMBER AND NAME 0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	SS-CPFF	Bell Helicopter, Dallas,TX	0.582	0.541	01/09	0.754	03/10					
Primary Hardware Development	SS-CPFF	VARIOUS	9.742									
Primary Hardware Development	SS-CPFF	Boeing, St. Louis				4.000	04/10					
Systems Engineering	VARIOUS	VARIOUS	9.278	0.100	VARIOUS	0.150	VARIOUS					
Systems Engineering	MP	US ARMY	0.125	0.075	11/08	0.050	03/10					
Systems Engineering	WR	NSWC CARDEROCK	4.520									
Subtotal Product Development			24.247	0.716		4.954						
Remarks:												
Development Support	WX	NSWC, CARDEROCK MD	2.483									
Software Development	SS-CPFF	Boeing, St. Louis	1.012									
Software Development	SS-CPFF	Boeing, St. Louis				2.000	04/10					
Technical Data	WX	VARIOUS	0.279									
Studies & Analyses	CPFF	SURVICE, INC	0.585									
Systems Eng (DC)	CPFF	SURVICE, INC	0.150	0.175	12/08							
Systems Eng (DC)	TBD	WYLE	0.060	0.048	12/08							
Subtotal Support			4.569	0.223		2.000						

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY			PROJECT NUMBER AND NAME 0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	WX	NAVAIR, Patuxent River MD	0.198			0.150	10/09					
Developmental Test & Evaluation	WX	VARIOUS	1.922			0.066	VARIOUS					
Developmental Test & Evaluation	WX	NAWCAD Patuxent River MD				1.500	06/10					
Live Fire Test & Evaluation	WX	NAWCWD CHINA LAKE CA	1.495	0.372	11/08							
Live Fire Test & Evaluation	MP	ARMY RESEARCH LAB	0.100	0.125	11/08	0.167	03/10					
Subtotal T&E			3.715	0.497		1.883						
Remarks:												
Program Management Support	VARIOUS	VARIOUS	0.523	0.100	12/08	0.142	10/09					
Program Management Support	WX	NAWCAD Patuxent River MD				0.500	10/09					
Program Management Support	TBD	JF TAYLOR LEX PK, MD	0.030	0.030	01/09	0.130	10/09					
Travel	TO	NAVAIR, Patuxent River MD	0.294	0.030	11/08	0.010	10/09					
Subtotal Management			0.847	0.160		0.782						
Remarks:												
Total Cost			33.378	1.596		9.619						
Remarks:												

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R4, Schedule Profile													DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY												PROJECT NUMBER AND NAME 0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY
Fiscal Year	FY 2008				FY 2009				FY 2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
Acquisition **Milestones**													
Survivability Master Plan Updates Asymmetric Threat Evaluations													
Technology Design & Development Rotary Wing Prototype Hardware Survivability Improvements													
Technology Test & Evaluation Rotary Wing Ballistic Testing Rotary Wing Signature Tests Prototype Hardware Tests													
Architecture Development IP-Based Architecture Development													
Production Milestones													
Deliveries													

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4				PROJECT NUMBER AND NAME 0591, ACFT SURVIVABILITY, VULNERABILITY & SAFETY				
Schedule Profile	FY 2008	FY 2009	FY 2010					
Technology Requirement								
Survivability Master Plan Updates		4Q						
Asymmetric Threat Evaluations	1Q-4Q	1Q-4Q	1Q-4Q					
Technology Design & Development								
Rotary Wing Prototype Hardware	1Q-4Q	1Q-4Q						
Survivability Improvements	1Q-4Q	1Q-4Q	1Q-4Q					
Technology Test & Evaluation								
Rotary Wing Ballistic Testing	1Q-4Q	1Q-4Q	1Q-4Q					
Rotary Wing Signature Tests	1Q-4Q	1Q-4Q	1Q-4Q					
Prototype Hardware Tests	1Q-4Q	1Q-4Q	1Q-4Q					
Architecture Development								
IP-Based Architecture Development			1Q-4Q					

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 0592, ACFT & ORDNANCE SAFETY			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**1.529**	**1.566**	**1.630**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Aircraft and Ordnance Safety Program transitions innovative munitions safety technology to Navy and Marine Corps air weapons, to comply with the Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to unplanned stimuli (thermal, impact, and shock events). The Aircraft and Ordnance Safety Program also ensures the safety and protection of personnel, aircraft, ships, and operational facilities, through improved precision targeting, fail-safe ordnance, selective effects munitions and shock/blast force protection technologies.

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0592, ACFT & ORDNANCE SAFETY

B. Accomplishments/Planned Program

Insensitive Munitions	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.529	1.566	1.630	
RDT&E Articles Quantity				

INSENSITIVE MUNITIONS
*Conduct improved air to air missile propulsion demonstration and testing. Output: baseline Insensitive Munitions (IM) performance of air breathing systems.
*Conduct shock/blast barrier protection demonstration and testing. Demonstrate pumice as a sympathetic detonation barrier for weapon shipping containers. Investigate alternative mitigation materials. Output: Design, modeling and demonstration of shock absorbent materials for the protection of weapons and weapon platforms.
*Demonstrate improved air launched munitions for force protection and homeland defense. Analysis, Design, Demonstration of an improved Navy IM bomb that will mitigate Sympathetic Detonation and cook-off threats. Output: Demonstrate/determine the IM and safety characteristics of improved air launched munitions.
*Develop and validate insensitive munitions solutions to advanced energetic material warheads and rocket motors. Hyperbaric materials, New binding materials, Novel fuses and high energy density materials. Continue Improved Navy IM bomb analysis/design/demo. Output: Design, modeling and demonstration of insensitive munitions solutions to new advanced energetic materials.
*Develop and validate insensitive munitions solutions for advanced containment/case/warhead materials. Metal matrix composite materials, High temperature cases, Reactive warheads, Composite cases. Continue evaluating reactive material warheads for IM compliance. Output: Design, modeling and demonstration of insensitive munitions solutions to new advanced containment/case/warhead materials.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0592, ACFT & ORDNANCE SAFETY

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
Not Applicable			

D. ACQUISITION STRATEGY:

The Aircraft and Ordnance Safety Project acquisition strategy consists of actions (technology transition) which are intended to assist the improvement of NAVAIR-cognizant munitions. Specific task planning involves close coordination with the program offices, field activities, and the IM and IMAD offices. Primary considerations in planning address windows of opportunity within the overall system procurement/life cycle, including milestone II Engineering adn Manufacturing Development (E&MD), Planned Product Improvement (P3I), and Product Improvement program (PIP) events. Munitions system design elements involving IM response risk (existing or anticipated) are analyzed in relation to proven and available IM technologies applicable to improvements in those design elements. When it is established that a system can probably be improved by implementing new technology and a window of opportunity for transition is available, the greatest overall improvement in fleet safety regarding IM response risk is the final deciding factor used to prioritize task selection for funding from limited resources.

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY			PROJECT NUMBER AND NAME 0592, ACFT & ORDNANCE SAFETY						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development												
Ancillary Hardware Development												
Aircraft Integration												
Ship Integration												
Ship Suitability												
Systems Engineering	WX	NAWCWD, China Lake CA	25.015	1.566	10/08	1.630	10/09					
Training Development												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			25.015	1.566		1.630						
Remarks:												
Total Cost			25.015	1.566		1.630						

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	0592, ACFT & ORDNANCE SAFETY	

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Air to Air Missile Demo/Testing												
Improved Air Launched Weapons												
Advanced Containment/Case/Warhead Materials												
Shock/Blast Barrier Protection Modeling and Demo/Testing												
Advanced Energetic Materials												

R-1 SHOPPING LIST - Item No.27

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 0592, ACFT & ORDNANCE SAFETY			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Air to Air Missile Demo/Testing	1Q-4Q	1Q-4Q	1Q-4Q					
Improved Air Launched Weapons	1Q-4Q	1Q-4Q	1Q-4Q					
Advanced Containment/Case/Warhead Materials	1Q-4Q	1Q-4Q	1Q-4Q					
Shock/Blast Barrier Protection Modeling and Demo/	1Q-4Q	1Q-4Q	1Q-4Q					
Advanced Energetic Materials	1Q-4Q	1Q-4Q	1Q-4Q					

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603216N, AVIATION SURVIVABILITY				PROJECT NUMBER AND NAME 1819, CV FIRE SUPPRESSION			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**0.688**	**0.727**	**0.749**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project develops improved fire fighting systems and fire protective measures for aircraft related fires on aircraft carriers, including assessment of fire properties, definition of fire threats, improvements to fire fighting agents and delivery systems, fire detection and suppression system performance evaluations, and fire fighter training improvements.

R-1 SHOPPING LIST - Item No. 27

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	1819, CV FIRE SUPPRESSION

B. Accomplishments/Planned Program

Fire Fighting	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	.688	.727	.749	
RDT&E Articles Quantity				

Fire Fighting Agents: Evaluate new or modified agents which adequately address changing agent restrictions or technical needs. Objective is to ensure that periodic, but unpredictable, restrictions on agent production or use, primarily driven by the environmental and toxicological fields, do not negatively impact fleet safety.

Fire Fighting Systems: Evaluate system automation features and demonstrate enhancements to personnel protection equipment. Objective is to evaluate system hardware for effectiveness against updated fire threats.

Fire Fighting Tactics: Evaluate reduced manning impact and resultant modifications to tactics. Provide opportunities for training during agent/system testing. Objective is to maintain emergency capabilities as reductions in manpower draw from available response crews.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603216N, AVIATION SURVIVABILITY	1819, CV FIRE SUPPRESSION

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
NOT APPLICABLE			

D. ACQUISITION STRATEGY:

NOT APPLICABLE

R-1 SHOPPING LIST - Item No. 27

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME **0603216N, AVIATION SURVIVABILITY**				PROJECT NUMBER AND NAME 9999, CONGRESSIONAL ADDS			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011				
Project Cost	**15.178**	**7.778**						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

CONGRESSIONAL ADDS

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603216N, AVIATION SURVIVABILITY	9999, CONGRESSIONAL ADDS

B. Accomplishments/Planned Program

9346A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.161		
RDT&E Articles Quantity			

EQUIPMENT LIFE EXTENSION PROJECT

This effort will fund an equipment life extension laboratory for definition of systems no longer procurable that are critical to functionality of weapon systems. By equipping currently existing in-house laboratories to maintain, modify, and update existing, non supported systems, a significant cost reduction will be realized.

9507A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.952		
RDT&E Articles Quantity			

INTELLENT AUTONOMY TRANSITION PROGRAM

A high level of autonomy is required to achieve manpower reduction goals, data-link bandwidth limitations, and covert operations. The challenge is integrating new technology into existing military unmanned craft and finding a Research and Development/Test and Integration Center to host developmental testing. Autonomous systems are non-deterministic which are very difficult to test/certify. The current effort attempts to break this cycle of cost increases for unmanned systems by developing control algorithms and low cost high bandwidth data links to connect the UAVs to the control system.

9510A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	0.790		
RDT&E Articles Quantity			

SILVER FOX UAV

Support the assessment of Silver Fox's ability to provide surveillance during mine clearing operations. In particular, search and scan patterns will be assessed and optimized. Key areas of study include determining resolution and field of view of the sensor as a function of altitude and mission profile.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603216N, AVIATION SURVIVABILITY	9999, CONGRESSIONAL ADDS

B. Accomplishments/Planned Program

9763A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.552		
RDT&E Articles Quantity			

SMART VISOR

The Smart Visor will integrate emerging liquid crystal and or thin film technologies into a visor substrate to improve laser eye protection. The approach is based on a polymeric stack that can be molded into the visor substrate. The second approach that could provide variable attenuation in real time is a spherical liquid crystal visor. Both approaches will provide cost effective broadband, variable density protection.

9961A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost		0.997	
RDT&E Articles Quantity			

AIR SENTINEL

Funding will develop an automated system that resides in the ground control station of a UAV system for the detection and management of unmanned aircraft emergencies.

9963A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.559		
RDT&E Articles Quantity			

INTELLIGENCE GATHERING UNINHABITED SYS

Funds to provide an operational system to joint ground forces for localized Intelligence, Surveillance, and Reconnaissance System that are based on an open and scalable systems architecture in a low impact and cost effective manner.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603216N, AVIATION SURVIVABILITY	9999, CONGRESSIONAL ADDS

B. Accomplishments/Planned Program

9965A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	2.722	1.994	
RDT&E Articles Quantity			

UNMANNED AIRCRAFT SYS OPTIMIZATION

To optimize the performance of the sensors onboard both manned and unmanned vehicles, stationary systems and smart dust.

9966A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	2.332		
RDT&E Articles Quantity			

UNMANNED FORCE AUTMENTATION SYS

To continue research, development and testing of advanced Unmanned Air System technologies that facilitate the rapid transition of Unmanned Air Vehicle systems to the warfighters that offe order-of-magnitude improvements in usability, capability, and operational effectiveness. impact and cost effective manner.

9B51A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.553	1.994	
RDT&E Articles Quantity			

MODULAR ADVANCED HELMET VISION SYSTEM

The Modular Advanced Helmet Vision Systems (MAVS) will provide significantly improved impact, hearing, laser eye, and chem-bio protection, along with communications and oxygen delivery, in a versatile, low-cost, mission reconfigurable design.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603216N, AVIATION SURVIVABILITY	9999, CONGRESSIONAL ADDS

B. Accomplishments/Planned Program

9B52A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost	1.557		
RDT&E Articles Quantity			

TECHNOLOGY COLLABORATION FOR AEROSPACE ENGINEERING

The Technology Collaboration for Aerospace will develop new and better system modeling software or processes for human systems integration (HSI) oriented engineering with initial emphasis on physical modeling of human body and human body components.

9D15A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost		0.798	
RDT&E Articles Quantity			

AGILE LASER EYE PROTECTION

Continue the development of the Unity Magnification Goggle to provide protection against a frequency agile laser and to integrate night vision cameras using an innovative optical design to allow day / night usage that does not reduce day acuity and color perception.

9D16A	FY 08	FY 09	FY10
Accomplishments/Effort/Subtotal Cost		1.995	
RDT&E Articles Quantity			

IN BUOY PROCESSOR FOR TASS

This funding provided support for the In Buoy Processor for TASS effort.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification				DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA4**			R-1 ITEM NOMENCLATURE 0603237N Deployable Joint Command & Control (DJC2)					
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Total PE Cost	**8.906**	**7.073**	**6.032**					
3050 Deployable Joint Command & Control	**8.906**	**5.876**	**6.032**					
9999 CONGRESSIONAL ADDS	**0.000**	**1.197**	**0.000**					
Quantity of RDT&E Articles								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Deployable Joint Command and Control (DJC2) is a Secretary of Defense (SecDef) and Chairman, Joint Chiefs of Staff (CJCS) priority DoD transformation initiative that is providing a standardized, integrated, rapidly deployable, modular, scaleable, and reconfigurable joint command and control (C2) capability to designated Geographic Combatant Commands (GCCs). DJC2 is the material solution to Defense Planning Guidance (DPG) that called for the development of Standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFC) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and Joint Force Commanders (JFCs) a mission critical, integrated family of systems with which to plan, control, coordinate, execute, and assess operations. It is designed to deploy rapidly, set up within hours, and quickly provide necessary C2 mission and collaboration functionality across the full spectrum of Joint Task Force (JTF) operations. The DJC2 program addresses both the Quadrennial Defense Review (QDR) finding that a joint command and control architecture needs to be developed for standing Joint Task Forces (JTFs) at each of the GCCs and the need for a deployable Joint Command and Control System described in the Transformation Study Report presented to the Secretary of Defense, April, 2001. It integrates the requirements for and lessons learned from U.S. Central Command's deployable headquarters funded from the FY 2001 Emergency Supplemental Act for Recovery from and Response to Terrorist Attacks on the United States. DJC2 is supported by SECDEF and CJCS. The JCS/Joint Requirement Oversight Council (JROC) has approved the DJC2 Mission Needs Statement (MNS) and Operational Requirements Document (ORD).

DJC2 seeks to provide standing, and standardized, joint C2 systems that can be deployed by RCCs or JTFs and the new SJFHQ concept and doctrine being developed by Joint Forces Command in coordination with other RCCs and the Joint Staff, as tasked by Defense Program Guidance (DPG). RCC and JTF commanders will use a deployable joint command and control capability for day-to-day operations, as well as when deployed for training or contingency operations. The capability is intended for all levels of conflict and will be reconfigurable to meet specific RCC and JTF mission requirements. This capability must be interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces.

DJC2 will utilize Global Command and Control System (GCCS) in its core suite of applications, ensuring interoperability with the worldwide-installed base of Global Command and Control System - Joint (GCCS-J).

The RDT&E line supports an evolutionary acquisition strategy. The intent of this strategy is to develop a system based upon a current understanding of joint requirements, rapidly field systems based upon those requirements, analyze operational utilization of the systems, and roll the results of the analysis into periodic upgrades of the systems to maintain currency and maximize operational effectiveness. Maximum use will be made of commercial technologies; technology insertion of each DJC2 suite will be made approximately every three years. The baseline Increment I configuration will be based upon existing Science and Technology (S&T) initiatives, Advanced Concepts Technology Demonstration (ACTD) Programs, programs of record, and fielded capabilities of the services and defense agencies, scaled to the Regional Combatant Commander (RCC) level. Subsequent deliveries will include newly developed capabilities based on emergent, joint requirements and operational feedback from utilization of earlier delivered systems, as well as incorporation of new commercial technologies.

FY10 funds development of increased efforts for systems engineering and integration, DJC2 Test Bed and increased Concept of Operations (CONOPS) experimentation system.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA 4	0603237N Deployable Joint Command & Control	3050 Deployable Joint Command & Control (DJC2)

B. PROGRAM CHANGE SUMMARY:

(U) Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	9.303	5.905	6.090
FY10 President's Budget	8.906	7.073	6.032
Total Adjustments	-0.397	1.168	-0.058
Summary of Adjustments			
Program Adjustments	-0.397		
Rate / Misc Adjustments		-0.032	-0.058
Congressional Adjustments		1.200	
Subtotal	-0.397	1.168	-0.058

Schedule:

Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA 4	0603237N Deployable Joint Command & Control	3050 Deployable Joint Command & Control (DJC2)

B. Accomplishments/Planned Program

Systems Engineering & Integration	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.236	1.621	1.991	
RDT&E Articles Quantity				

FY08 ACCOMPLISHMENTS: Identified upgrades to the Increment I DJC2 Systems. Continued Increment I migration to Net-Centricity and updated design documentation and training material to reflect changes driven by emerging and required Enterprise Services Key Information Profiles (KIP). Updated system to meet Transport KIP requirements mandated by the Net Ready Key Performance Parameter levied on DJC2 by the Joint Requirements Oversight Council. Obtained prototype upgrade equipment and conducted trade studies per the system engineering guidelines. Documented system performance and finalized a design for DJC2 Increment I Upgrade. Conducted Critical Design Review for upgrade plan and prepared the mandatory Engineering Change Proposal, identifying all testing, training, support and sparing requirements. Constructed, integrated and tested an alternative packing capability for DJC2. Identified, integrated and tested world-wide power modification to DJC2.

FY09 PLAN: Complete Critical Design Reviews for upgrade plan. Continue with system engineering analysis and Integration activities. Operational test technology insertion/technology refresh design modifications.

FY10 PLAN: Continue tracking KIP migration and impacts to DJC2. Single out improvement in infrastructure equipment to include power generation, soft shelter design and video distribution for design modification. Evaluate Ka Band SHF radio upgrades to both Early Entry communication package and Rapid Response Kits. Conduct design reviews to reflect outcome of the trade studies/experimentation.

DJC2 RDT&E Test Bed	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.720	3.028	3.421	
RDT&E Articles Quantity				

FY08 ACCOMPLISHMENTS: Conducted field testing and developmental testing of final Increment I Upgrade system. Tested integrated alternate C2 packaging arrangement. Upgraded the Developmental Test Unit to production representation in order to be used for operational testing. Supported the operational testing of the new design in a operational scenario to validate measures of effectiveness and measures of suitability.

FY09 PLAN: Identify and incorporate changes in the DJC2 test bed based upon lessons learned from fielded systems and operational testing

FY10 PLAN: Update the DJC2 Test Bed to facilitate testing of new hardware necessary to support trade studies and design reviews for infrastructure and communications refresh. Apply lessons learned from fielded and like systems to assist in driving the revitalized design.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA 4	0603237N Deployable Joint Command & Control	3050 Deployable Joint Command & Control (DJC2)

B. Accomplishments/Planned Program

Acquisition Documentation Activities	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	1.300	0.771	0.000	
RDT&E Articles Quantity				

FY08 ACCOMPLISHMENTS: Analyzed, prepared, and performed In-Process Review (IPR), and Milestone acquisition activities.

FY09 PLAN: Continue to analyze, prepare, and perform In-Process Review (IPR), and Milestone acquisition activities.

CONOPS Experimentation System	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.650	0.456	0.620	
RDT&E Articles Quantity				

FY08 ACCOMPLISHMENTS: Provided component upgrade for Concept of Operations (CONOPS) System at Joint Forces Command (JFCOM).

FY09 PLAN: Continue component upgrades for CONOPS System at JFCOM.

FY10 PLAN: Continue component upgrades for CONOPS System at JFCOM.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**	PROGRAM ELEMENT NUMBER AND NAME 0603237N Deployable Joint Command & Control	PROJECT NUMBER AND NAME 3050 Deployable Joint Command & Control (DJC2)

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	To Complete	Total Cost
OPN BLI 2804	0.000	9.004	8.719							

D. ACQUISITION STRATEGY:

This RDT&E line supports an evolutionary acquisition strategy. The intent of this strategy is to: develop a system based upon a current understanding of joint requirements; rapidly field systems based upon those requirements; analyze operational utilization of the systems; and roll the results of the analysis into periodic upgrades of the systems to maintain currency and maximize operational effectiveness. The Increment I configuration will be based upon existing C4I systems, scaled to the Combatant Command level. The follow-on configurations will include newly developed capabilities based on emergent, joint requirements and operational feedback based upon utilization of earlier delivered systems.

E. METRICS:

Earned Value Management (EVM) is used for metrics reporting and risk management.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**		PROGRAM ELEMENT 0603237N Deployable Joint Command & Control				PROJECT NUMBER AND NAME 3050 Deployable Joint Command & Control (DJC2)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	VAR	NSWC, Crane, USA, & VAR	19.011	0.456	VAR	0.620	VAR			Continuing	Continuing	
Ancillary Hardware Development												
Aircraft Integration												
Ship Integration												
Ship Suitability												
Systems Engineering	VAR	VAR	41.772	1.321	VAR	1.489	VAR			Continuing	Continuing	
Training Development												
Engineering Facility Development	WX	NSWC, CSS	28.236	1.953	VAR	2.214	VAR			Continuing	Continuing	
Tooling												
GFE												
Award Fees												
Subtotal Product Development			89.019	3.730		4.323		0.000		Continuing	Continuing	
Remarks:												
Development Support												
Software Integration	VAR	NSWC, CSS & VAR	38.649	0.300	VAR	0.502	VAR			Continuing	Continuing	
Integrated Logistics Support												
Configuration Management												
Technical Investigations	VAR	NTA & VAR	13.426							Continuing	Continuing	
Trade-off Studies & Analyses	VAR	NTA & VAR	9.000							Continuing	Continuing	
GFE												
Award Fees												
Subtotal Support			61.075	0.300		0.502		0.000		Continuing	Continuing	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**		PROGRAM ELEMENT 0603237N Deployable Joint Command & Control				PROJECT NUMBER AND NAME 3050 Deployable Joint Command & Control (DJC2)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date	FY 11 Cost	FY 11 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MPR	46th Test Wing & VAR	8.860	0.500	VAR	0.565	VAR			Continuing	Continuing	
Operational Test & Evaluation	VAR	OPTEVFOR & VAR	9.768	0.575	VAR	0.642	VAR			Continuing	Continuing	
Live Fire Test & Evaluation												
Test Assets	MPR	Eglin AFB & VAR	4.000							Continuing	Continuing	
Tooling												
GFE												
Award Fees												
Subtotal T&E			22.628	1.075		1.207		0.000		Continuing	Continuing	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	VAR	NSWC, CSS & VAR	29.741	0.771	VAR	0.000	VAR			Continuing	Continuing	
Travel												
Transportation												
Subtotal Management			29.741	0.771		0.000		0.000		Continuing	Continuing	
Remarks:												
Total Cost			202.463	5.876		6.032		0.000		Continuing	Continuing	
Remarks:												

Exhibit R-3, Project Cost Analysis

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																																				DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**					PROGRAM ELEMENT NUMBER AND NAME 0603237N Deployable Joint Command & Control												PROJECT NUMBER AND NAME 3050 Deployable Joint Command & Control (DJC2)																					
Fiscal Year	2007				2008				2009				2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones																																				
MILESTONE C																																				
IOC		▲ Increment I																																		
FDDR								▲ Increment I																												
Test & Evaluation Milestones																																				
Development Test						▲ DT																														
Operational Test							▲ OT			△ D / OT					△ D / OT																					
Production Milestones																																				
Deliveries																																				

Exhibit R-4, Schedule Profile

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**	PROGRAM ELEMENT NUMBER AND NAME 0603237N Deployable Joint Command & Control				PROJECT NUMBER AND NAME 3050 Deployable Joint Command & Control (DJC2)				
Schedule Profile	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
MILESTONE C									
INCREMENT I									
IOC									
INCREMENT I	2Q								
FDDR									
INCREMENT I		4Q							
TEST AND EVALUATION MILESTONES									
DEVELOPMENTAL TEST		2Q	2Q	3Q					
OPERATIONAL TEST		3Q	2Q	3Q					

Exhibit R-4a, Schedule Profile

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA 4	0603237N Deployable Joint Command & Control	9999 Deployable Command & Control Vehicle (DCCV)

B. Accomplishments/Planned Program

9D17A Deployable Command and Control Vehicle	FY 08	FY 09	FY 10	FY 11
Accomplishments/Effort/Subtotal Cost	0.000	1.197	0.000	0.000
RDT&E Articles Quantity				

FY09 PLAN: Systems engineering & integration and testing activities for U.S. Northern Command (NORTHCOM) Deployable Command and Control Vehicle (DCCV) variant.

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4						R-1 ITEM NOMENCLATURE 0603254N, ASW SYSTEMS DEVELOPMENT		
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	20.640	36.885	16.585					
0490 AIRBORNE ACOUSTIC INTELLIGENCE	3.582	3.732	3.562					
1292 ADV ASW SENSORS & PROC	3.732	7.184	10.069					
3222 ADVANCED HIGH ALTITUDE ASW FOR P-8			2.954					
9177 EPAS	6.552	9.660						
9347 CLAYMORE MARINE	2.887	4.940						
9999 CONGRESSIONAL ADD	3.887	11.369						

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

0490. In January 2008, OPNAV changed 0490 title from Project Beartrap to Airborne Acoustic Intelligence (AAI). The mission of AAI (CNO Project K-0416) is to provide Sound Pressure Level (SPL) quality recordings of targets of interest and an associated new technology, rapid prototyping mechanism for the application of state-of-the-art collection sensors. The program will develop and rapidly deploy new technology concepts in hardware and software to effectively address emerging littoral threats and to improve the present Undersea Warfare capability in suport of Sea Shield/Sea Trial Initiatives. AAI also provides a measurement analysis capability to reconstruct, analyze, and develop active and target strength measurement validation. The AAI data collection program provides passive and active acoustic and non-acoustic data essential for the design and development o environmental models, sensors, weapons, software algorithms, and tactical decision aids. AAI employs developmental and prototypical hardware installed in uniquely configured ASW aircraft to collect data of interest, and specially configured ground support facilities to conduct reconstruction and analysis of this data. AAI includes calibrated recording systems, advanced detection and tracking systems, special sensors, advanced processing systems and techniques and specially derived operational tactics.

1292. This program provides Anti-Submarine Warfare (ASW) platform effectiveness through development of advanced hardware and software associated with airborne acoustic systems. This includes sensors, processing, post-processing, data recording and display capabilities to address regional threat scenarios against conventionally and nuclear powered submarines. Key objectives are platform accommodations of advanced active and passive sensors, improved detection, classification, localization, tracking, and increased capacity and flexibility to handle multi-sensor data loads. Programs being funded during the FYDP will investigate technologies such as: Over the Horizon (OTH) Communications, Distributed Netted Sensors, exploitation of forward scatter, transient signals, and source and receiver improvement technologies that will enhance passive and Multi-static Activ Sensor Systems capabilities. Other programs being funded during the FYDP will provide for the development of persistent tactical search technologies that will allow transition to the localization and attack phase in all operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of Multi-static Active (MSA) sources and receivers with the associated USQ-78B (series) processor.

3222. The objective of this project is to develop the capability for precision standoff delivery of sonobuoys from high altitude in order to improve tactical flexibility and mission performance of ASW aircraft. Current NAVAIR SBIRs are exploring promising technologies and are assessing the feasibility and practicality of proposed solutions for the precision placement of sonobuoys. This program will leverage SBIR technology to refine system concepts and to conduct field experiments and tests to evaluate technology solutions and assess their performance, cost, and producibility. Pending successful demonstration of precision placement technology, design modifications to current sonobuoy sensors will be matured and prototyped for qualification and testing leading to transition into P-8A.

9177. The objective of the Electro-optic Passive ASW Sensor (EPAS) program is to 1) demonstrate the concept that an integrated suite of non-acoustic sensors will provide an effective real time, day and night air ASW detection, localization and tracking capability in acoustically challenging shallow regions and deep water areas of uncertainty (AOU). 2) develop and demonstrate a cross platform non-acoustic system for fixed wing, helicopter, aerostat, and unmanned aerial vehicle ASW platforms. Navy funding for FY07-09 supports the development, integration, and demonstration testing of four (4) second generation prototype EPAS systems (EPAS/Joint Multi-Mission Electro-optic System (JMMES)) with algorithm based integrated sensor operation and ASW automatic target recognition/operator cueing software modules. The EPAS technology and ASW mission module software has been leveraged to develop multi-mission capability for other targets of Naval interest including maritime and overland surface warfare, maritime inderdiction operations, mine counter measures in a FY07 new start Joint Capability Technology Demonstration (JCTD) sponsored by the Deputy Undersecretary of Defense for Acquisition, Technology and Logistics.

Congressional add 9D16A In Buoy Processor for TASS is listed under PE 0603216N in the controls, however, 9D16A is executed under PE 0603254N.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4	R-1 ITEM NOMENCLATURE 0603254N, ASW SYSTEMS DEVELOPMENT

B. PROGRAM CHANGE SUMMARY

Funding:	FY 2008	FY 2009	FY 2010
Previous President's Budget:	20.378	28.799	13.761
Current President's Budget:	20.640	36.885	16.585
Total Adjustments	0.262	8.086	2.824

Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		8.187	
SBIR/STTR/FTT Assessments	-0.219		
Program Adjustments	0.481		2.831
Rate/Misc Adjustments		-0.101	-0.007
Subtotal	0.262	8.086	2.824

Schedule:

0490. First article decrease in Target Strength processor deliveries in FY10 from 2 to 1. The host for active Target Strength Processing is TAPS. Planned upgrades to TAPS are now included in the Target Strength Processor Product and are combined as a single product.

1292. Added OTH Communications performance assessment FY09. Added Software Development to reflect S/W timeline. Added deliveries thru the FYDP. Due to funding reduction in 1Q/09, unable to participate in scheduled experiments/exercises and unable to procure planned 200 test articles.

3222. Schedule added to reflect development of system concepts and technology demonstration during the FYDP.

9177. Removed Decision milestone from 1Q/FY09; transition deferred to 3Q/FY10. Extended Flight Testing on Commercial and Research Test A/C from 3Q/09 to 4Q/09.

9347. Added deliveries in 3Q/08.

Technical:
0490. Defined Active Measurement Validation as a separate cost category for improved programmatic tracking. Active Measurement Validation is an output product of the Active Target Strength (T.S.) project.

EXHIBIT R-2a, RDT&E Project Justification									DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603254N, ASW SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 0490, AIRBORNE ACOUSTIC INTELLIGENCE					
COST ($ in Millions)	FY 2008	FY 2009	FY 2010						
0490 AIRBORNE ACOUSTIC INTELLIGENCE	3.582	3.732	3.562						
RDT&E Articles Qty	3	2	2						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The mission of Airborne Acoustic Intelligence (AAI) (CNO Project K-0416) is to provide SPL quality recordings of targets of interest and an associated new technology, rapid prototyping mechanism for the application of state-of-the-art collection sensors. The program will develop and rapidly deploy new technology concepts in hardware and software to effectively address emerging littoral threats and to improve the present Undersea Warfare capability in support of Sea Shield/Sea Trial Initiatives. AAI also provides a measurement analysis capability to reconstruct, analyze and develop active target strength measurement validation. The AAI data collection program provides passive and active acoustic and non-acoustic data essential for the design and development of environmental models, sensors, weapons, software algorithms, and tactical decision aids. AAI employs developmental and prototypical hardware installed in uniquely configured ASW aircraft to collect data of interest, and specially configured ground support facilities to conduct reconstruction and analysis of this data. AAI includes calibrated recording systems, advanced detection and tracking systems, special sensors, advanced processing systems and techniques and specially derived operational tactics. The 7 RDT&E articles consist of aircraft calibration units, Sound Pressure Level (SPL) collection suites, and post mission processors that will support the collection mission.

B. ACCOMPLISHMENTS / PLANNED PROGRAM:

Systems Engineering / Aircraft Mods

Commence Active Acoustic program

	FY 2008	FY 2009	FY 2010
Accomplishments / Effort / Sub-total Cost	2.812	2.582	2.412
RDT&E Articles Qty	3	2	2

Engineering to support SPL Recording. Post mission processor upgrade and engineering to support aircraft calibration unit enhancements for active target strength. Engineering development of Target Strength processing and prototype processor.

Data Collection and Analysis

	FY 2008	FY 2009	FY 2010
Accomplishments / Effort / Sub-total Cost	.770	.750	.750
RDT&E Articles Qty			

Data collection support at Operational Wings. Ongoing collection of high interest acoustic and non-acoustic data in support of Measurement/Measuring and Signature Intelligence (MASINT)/Office of Naval Intelligence (ONI) threat assessment requirements. Reduction, Analysis and Fleet Rapid Feedback. Conduct airborne special operations support. Essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development.

Active Measurement Validation

	FY 2008	FY 2009	FY 2010
Accomplishments / Effort / Sub-total Cost		.400	.400
RDT&E Articles Qty			

Active Measurement Validation of targets of interest. Provides the acoustic analysis of echo characterization (which includes: signal excess (SE) measurements, peak frequency (PF), trend analysis and pulse duration measurements) and target strength.

C. OTHER PROGRAM FUNDING SUMMARY: FY 2008 FY 2009 FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

Airborne Acoustic Intelligence (AAI) is a CNO Special Project. The included technology developments are primarily in-house with contractor participation through existing vehicles.

Exhibit R-3 Cost Analysis (page 1)		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0603254N, ASW SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 0490, Airborne Acoustic Intelligence

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date					
PRODUCT DEVELOPMENT												
Active Measurement Validation	WX	NAWCAD, PATUXENT RIVER, MD		.400	10/08	.400	10/09					
Ancillary Hdw Development	WX	NAWCAD, PATUXENT RIVER, MD	4.069	.750	10/08	.750	10/09					
Systems Eng	WX	NAWCAD, PATUXENT RIVER, MD	68.388	2.582	10/08	2.412	10/09					
SUBTOTAL PRODUCT DEVELOPMENT			72.457	3.732		3.562						

Remarks:

SUPPORT												
SUBTOTAL SUPPORT												

Remarks:

TEST & EVALUATION												
SUBTOTAL TEST & EVALUATION												

Remarks:

MANAGEMENT												
Travel	TO	NAVAIR, PATUXENT RIVER MD	.095									
SUBTOTAL MANAGEMENT			.095									

Remarks:

Total Cost			72.552	3.732		3.562						

Remarks:

EXHIBIT R4, Schedule Profile
Data Collection and Analysis/ Prototype & Installation

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E,N / BA-4	0603254N, ASW SYSTEMS DEVELOPMENT	0490, Airborne Acoustic Intelligence

Fiscal Year	FY 2008				FY 2009				FY 2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones												
Systems Engineering P-3 Avionics Suite								△			(1) ▽	
Tactical Acoustic Processor(TAPS)	△	(1)				(1)						
T.S Processor Development/Prototype	△			(2)			(1)				(1)	
Test & Evaluation Milestones												
Production Milestones												
Product Development Data Collection/Analysis												
Deliveries												
P-3 Avionics											(1)	
Tactical Acoustic Processor	(1)					(1)						
T.S. Processor				(2)			(1)				(1)	

Exhibit R-4a, Schedule Detail Data Collection and Analysis/ Prototype & Installation					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0603254N, ASW SYSTEMS DEVELOPMENT				PROJECT NUMBER AND NAME 0490, AIRBORNE ACOUSTIC INTELLIGENCE			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Sys. Eng. Avionics Suite			1Q-4Q					
Sys. Eng. Tactical Acoustic Processor (TAPS)	1Q-4Q	1Q-4Q	1Q-4Q					
Target Strength Processor Dev't/Prototype	1Q-4Q	1Q-4Q	1Q-4Q					
Data Collection and Analysis	1Q-4Q	1Q-4Q	1Q-4Q					
Deliveries								
P-3 Avionics			3Q					
Tactical Acoustic Processor	2Q	2Q						
T.S. Processor	4Q	3Q	3Q					

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603254N, ASW SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 1292, ADV ASW SENSORS & PROC	

COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
1292 ADV ASW SENSORS & PROC	3.732	7.184	10.069					
RDT&E Articles Qty	100	200	300					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program provides Anti-Submarine Warfare (ASW) platform effectiveness through development of advanced hardware and software associated with airborne acoustic systems. This includes sensors, processing, post-processing, data recording and display capabilities to address regional threat scenarios against conventional and nuclear powered submarines. Key objectives are platform accommodations of advanced active and passive sensors, improved detection, classification, localization, tracking, and increased capacity and accommodations to handle multi-sensor data loads. Programs being funded during the FYDP will investigate technologies such as: Over the Horizon (OTH) Communications, Distributed Netted Sensors, exploitation of forward scatter, transient signals, and source and receiver improvement technologies that will enhance passive and Multi-Static Active Sensor Systems capabilities. Other programs being funded during the FYDP will provide for the development of persistent tactical search technologies that will allow transition to the localization and attack phase in a operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of Multi-Static Active sources and receivers with the associated USQ-78B (series) processor. The 600 test articles, which consist of passive/active sensors and associated processors, will support at-sea trials and experiments.

B. ACCOMPLISHMENTS / PLANNED PROGRAM:

System performance assessments	FY 2008	FY 2009	FY 2010
Accomplishments / Effort / Sub-total Cost	3.732	7.184	10.069
RDT&E Articles Qty	100	200	300

System performance assessments for Multi-Static Active (Coherent) ASW algorithms and system enhancements. System performance assessment for Multi-Static Active (Coherent) source and receivers technologies. Due to a $3.0M reduction in 1Q/09 for Program Growth (Issue #74048), unable to participate in scheduled experiments/exercises and unable to procure planned 200 test articles.

C. OTHER PROGRAM FUNDING SUMMARY: FY 2008 FY 2009 FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

The included technology developments are primarily in-house with contractor participation through existing vehicles.

Exhibit R-3 Cost Analysis (page 1)			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME	
RDT&E,N / BA-4	0603254N, ASW SYSTEMS DEVELOPMENT	1292, ADV ASW SENSORS & PROC	

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date					
PRODUCT DEVELOPMENT												
Primary Hdw Development	VARIOUS	VARIOUS		.500	11/08	.300	11/09					
SUBTOTAL PRODUCT DEVELOPMENT				.500		.300						

Remarks:

SUPPORT												
Software Development	WX	NAWCAD, PATUXENT RIVER, MD	1.000	2.000	11/08	2.425	11/09					
Studies & Analyses	WX	NAWCAD, PATUXENT RIVER, MD	.500	1.446	11/08	4.681	11/09					
SUBTOTAL SUPPORT			1.500	3.446		7.106						

Remarks:

TEST & EVALUATION												
Dev Test & Eval	VARIOUS	VARIOUS	14.431	1.000	11/08	.500	11/09					
SUBTOTAL TEST & EVALUATION			14.431	1.000		.500						

Remarks:

MANAGEMENT												
Contractor Eng Sup	VARIOUS	VARIOUS	5.677									
ENG & TECH SVCS (NON-FFRDC)	VARIOUS	VARIOUS	2.172	.232	11/08	.310	11/09					
Government Eng Sup	WX	NAWCAD, PATUXENT RIVER, MD	52.019	1.931	11/08	1.773	11/09					
Travel	TO	VARIOUS	.090	.075	11/08	.080	11/09					
SUBTOTAL MANAGEMENT			59.958	2.238		2.163						

Remarks:

Total Cost			75.889	7.184		10.069						

Remarks:

EXHIBIT R4, Schedule Profile
ADV ASW SENSORS & PROC

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E,N / BA-4	0603254N, ASW SYSTEMS DEVELOPMENT	1292, ADV ASW SENSORS & PROC

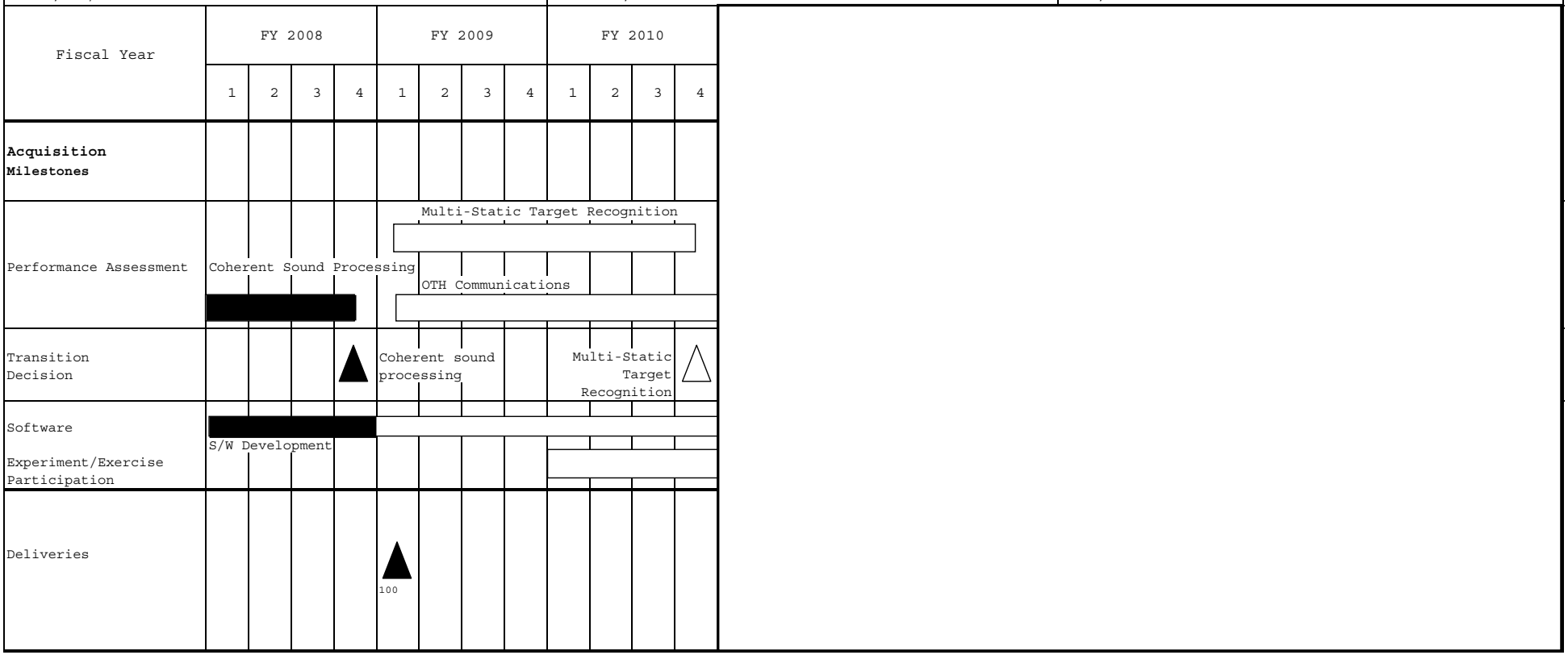


Exhibit R-4a, Schedule Detail ADV ASW SENSORS & PROC								DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0603254N, ASW SYSTEMS DEVELOPMENT				PROJECT NUMBER AND NAME 1292, ADV ASW SENSORS & PROC			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Performance Assessment	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Transition Decision	4Q		4Q					
Software Development	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Experiment/Exercise Participation		1Q - 4Q	1Q - 4Q					
Deliveries		1Q	1Q					

EXHIBIT R-2a, RDT&E Project Justification								DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT NUMBER AND NAME 0603254N, ASW SYSTEMS DEVELOPMENT			PROJECT NUMBER AND NAME 3222, ADVANCED HIGH ALTITUDE ASW FOR P-8				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
3222 ADVANCED HIGH ALTITUDE ASW FOR P-8			2.954					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The objective of this project is to develop the capability for precision standoff delivery of sonobuoys from high altitude in order to improve tactical flexibility and mission performance of ASW aircraft. Current NAVAIR SBIRs are exploring promising technologies and are assessing the feasibility and practicality of proposed solutions for the precision placement of sonobuoys. This program will leverage SBIR technology to refine system concepts and to conduct field experiments and tests to evaluate technology solutions and assess their performance, cost, and producibility. Pending successful demonstration of precision placement technology, design modifications to current sonobuoy sensors will be matured and prototyped for qualification and testing leading to transition into P-8A.

B. ACCOMPLISHMENTS / PLANNED PROGRAM:

Provide precision delivery of sonobuoys	FY 2008	FY 2009	FY 2010
Accomplishments / Effort / Sub-total Cost			2.954
RDT&E Articles Qty			

This effort supports improvement in AIR ASW capability by providing for precision delivery of sonobuoys from Maritime Patrol Aircraft at high altitude. Various concepts will be analyzed. Prototype methods of sonobuoy delivery will be explored in order to achieve accurate placement from high altitudes. Technology Readiness Level will be improved to support planning for transition to acquisition.

C. OTHER PROGRAM FUNDING SUMMARY: FY 2008 FY 2009 FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

Various sole source and/or competitive R&D contracts to develop precision placement technologies for sonobuoys. Develop modifications to incorporate capability into current sonobuoy sensors and integration into P-8A as the lead aircraft.

Exhibit R-3 Cost Analysis (page 1)			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0603254N, ASW SYSTEMS DEVELOPMENT	PROJECT NUMBER AND NAME 3222 ADVANCED HIGH ALTITUDE ASW FOR P-8	

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date					
PRODUCT DEVELOPMENT												
Primary Hardware Development	VARIOUS	VARIOUS										
A/C HW/SW Integration	VARIOUS	VARIOUS										
SUBTOTAL PRODUCT DEVELOPMENT												

Remarks:

SUPPORT												
Program Documentation	VARIOUS	VARIOUS										
Studies and Analysis	WX	NAWCAD, PATUXENT RIVER, MD				.700	11/09					
Studies and Analysis	VARIOUS	VARIOUS				1.200	11/09					
SUBTOTAL SUPPORT						1.900						

Remarks:

TEST & EVALUATION												
Field Tests	WX	NAWCAD, PATUXENT RIVER, MD										
Field Tests	VARIOUS	VARIOUS										
SUBTOTAL TEST & EVALUATION												

Remarks:

MANAGEMENT												
Contractor Eng Sup	VARIOUS	VARIOUS				.150	11/09					
ENG & TECH SRVC (NON-FFRDC)	VARIOUS	VARIOUS				.150	11/09					
Government Eng Sup	WX	NAWCAD, PATUXENT RIVER, MD				.739	11/09					
Travel	VARIOUS	TBD				.015	11/09					
SUBTOTAL MANAGEMENT						1.054						

Remarks:

Total Cost						2.954						

Remarks:

EXHIBIT R4, Schedule Profile
ADVANCED HIGH ALTITUDE ASW FOR P-8

DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	**0603254N, ASW SYSTEMS DEVELOPMENT**	3222, ADVANCED HIGH ALTITUDE ASW FOR P-8

Fiscal Year	FY 2008				FY 2009				FY 2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones	**Precision Placement of Sonobuoys for HAASW is a Technology Development, Non ACA project.**											
Contract Awards									△ Studies			
Trade Studies			Study and analyze concept options									
HW/SW Product Development												
Experimentation & Tech Demos												
Transtion Decisions												
Deliveries												

Exhibit R-4a, Schedule Detail **ADVANCED HIGH ALTITUDE ASW FOR P-8**					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0603254N, ASW SYSTEMS DEVELOPMENT				PROJECT NUMBER AND NAME 3222, ADVANCED HIGH ALTITUDE ASW FOR P-8			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Study Contracts			1Q					
Technology Development Contracts								
Trade Studies			1Q-4Q					
HW/SW Product Development								
Experimentation and Tech Demo								
Transition Decisions								
Deliveries								

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY /** BA-4					R-1 ITEM NOMENCLATURE **0603261N, Tactical Airborne Reconnaissance**			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**6.837**	**4.243**	**7.713**					
2467, UAV CONOPS	**6.837**	**4.243**	**5.991**					
2910, JOINT TECH CENTER/SYSTEMS INTEG LAB*			**1.722**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

UAV CONOPS - In support of the Navy's overall UAS strategy, this program develops Concept of Operations (CONOPS) that integrate UASs into the Chief of Naval Operations (CNO)/Navy Vision of Sea Power 21 (Sea Shield, Sea Strike, Sea Basing, and FORCEnet). By providing fleet input based on current operations with UASs in a simulated combat environment, this CONOPS development investment is the foundation of how the Carrier Strike Group (CSG) and the Expeditionary Strike Group (ESG) will operate a combined Manned and Unmanned Naval Air Force.

JTC/SIL (Joint Technology Center/System Integration Laboratory): JTC/SIL provides experimentation for UAV technology assessment, insertion, demonstration, transfer, as well as simulation and exercise support.

*FY 2008 and FY 2009 JTC/SIL are budgeted under PE 0305204N PU 2910. JTC/SIL was realigned to 0603261N beginning FY2010.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**	R-1 ITEM NOMENCLATURE **0603261N, Tactical Airborne Reconnaissance**

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	4.037	4.298	4.311
Current President's Budget:	6.837	4.243	7.713
Total Adjustments	2.800	-0.055	3.402
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments	2.800	0.043	
SBIR/STTR/FTT Assessments			
Program Adjustments			3.403
Rate/Misc Adjustments		0.012	-0.001
Subtotal	2.800	0.055	3.402

Schedule:

Additional Targeting studies are required to support Weapons studies and demos. Additional Weapons and Payload CONOPS studies and demos are planned as UAV utility expands. Tasking and Manning Assessment (Focused Flying) are expanded to include CONOPS across Naval platforms.

The Operational Test Milestones were removed from the schedule as they were left over from when this PE provided funding to the Naval Strike Warfare Center, Fallon, to obtain an operational assessment of CONOPS demo/study results during their training sessions. It was an oversight that they were never removed from the schedule.

Technical:

2467 CONOPS - UAS CONOPS studies and demos focused on Weapon and Payload employment.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME **0603261N, Tactical Airborne Reconnaissance**				PROJECT NUMBER AND NAME **2467, UAV CONOPS**			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**6.837**	**4.243**	**5.991**					
RDT&E Articles Qty	**1**							

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Naval Unmanned Aircraft Systems (UAS) Strategy employs a family of UASs to perform tactical, persistent and – penetrating Intelligence, Surveillance, and Reconnaissance (ISR) in support of Naval and Joint missions from forward bases/platforms and naval ships.

In support of the Navy's overall UAS strategy, this program develops Concept of Operations (CONOPS) that integrate UASs into the Chief of Naval Operations (CNO)/Navy Vision of Sea Power 21 (Sea Shield, Sea Strike, Sea Basing, and FORCEnet). By providing fleet input based on current operations with UASs in a simulated combat environment, this CONOPS development investment is the foundation of how the Carrier Strike Group (CSG) and the Expeditionary Strike Group (ESG) will operate a combined Manned and Unmanned Naval Air Force. Specifically:

- Provides studies and demonstrations in support of the Naval UAS Family of Systems (FoS) CONOPS development
- Develops, demonstrates, and evaluates CONOPS, and assesses manning requirements of ship-based tactical UASs
- Conducts studies and demonstrations to develop and support the Naval UAS FoS Kill Chain Integration
- Develops the Naval UAS FoS Architecture to support integration into USN battle space dominance operations and network centric warfare
- Develops Intelligence, Surveillance, and Reconnaissance (ISR) CONOPS in support of Major Combat Operations (MCOs), Global War on Terror (GWOT), and Combat Search and Rescue (CSAR)
- Provides Naval support for development of Standards across DOD UASs and NATO, emphasizing standardization and interoperability
- Conducts studies for UAS tasks, data management, airspace integration, Sense & Avoid, and Focused Flying efforts
- Conducts CONOPS studies, demonstrations, and exercises for Vehicle Control, Targeting, and weapons, sensor, and payload employment
- Utilizes a UAS CONOPS demonstration system for CONOPS development, test and evaluation, and expediting technology transition. The demonstration system consists of a ground control station, launch and recovery equipment, air vehicles, spares, and associated equipment

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2467, UAV CONOPS**

B. Accomplishments/Planned Program

Studies and Demonstrations	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.269	0.600	0.700	
RDT&E Articles Quantity	1			

Studies and demonstrations to develop CONOPS for manned-unmanned integration of UAS and aircraft systems. Purchase a UAS CONOPS demonstration system for CONOPS development, test and evaluation, and technology transition.

Shipboard CONOPS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.241	1.245	1.310	
RDT&E Articles Quantity				

Shipboard CONOPS - Conduct studies, demonstrations, and exercises for data relay, comm relay, targeting, vehicle control, and weapons, sensor, and payload employment.

Engineering and Program Support	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.430	1.027	0.915	
RDT&E Articles Quantity				

Government engineering support, program office travel, and contract support services.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2467, UAV CONOPS**	

B. Accomplishments/Planned Program (Cont.)

NATO STANAG and Interoperability	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.097	1.371	1.158	
RDT&E Articles Quantity				

Conduct CONOPS studies for interoperability and development of standards across UASs and NATO emphazing standardization and interoperability.

Architecture Support / Common Ground Station	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			1.908	
RDT&E Articles Quantity				

Joint service revision configuration management of Unmanned System Interoperability profile and Joint Common Ground Station Architecture. Government engineering support.

MCTUAS Re-Wing Effort	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	2.800			
RDT&E Articles Quantity				

RQ-7 is procured through the Army on the Army's Shadow TUAS production contract and is identical to the Army's system. The Marine Corps configuration matches the Army's to ensure combat units have maximum interoperability, maintainability, and combat effectiveness. The Re-Wing configuration provides greater flight endurance and allows for follow-on technology improvements.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2467, UAV CONOPS**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

Not Applicable

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603261N, Tactical Airborne Reconnaissance			PROJECT NUMBER AND NAME 2467, UAV CONOPS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	SS/FPIF	AAI, Hunt Valley, MD	2.800									
Ancillary Hardware Development												
Aircraft Integration												
Ship Integration	Various	Various	3.686	0.951	11/08	0.768	11/09					
Ship Suitability												
Systems Engineering	WX	NAWCAD, Pax River	1.485	0.275	11/08	0.282	11/09					
Training Development												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			7.971	1.226		1.050						
Remarks:												
Development Support	Various	Various	12.071	0.429	12/08	0.432	02/10					
Software Development	C/CPFF	Various	2.250			1.908	02/10					
Integrated Logistics Support												
Configuration Management												
Technical Data												
Studies & Analyses	WX	NAWCWD, China Lake	1.392	0.346	12/08	0.347	12/09					
Studies & Analyses	WX	NAWCAD, Pax River	0.564	1.025	12/08	1.030	12/09					
Award Fees												
Subtotal Support			16.277	1.800		3.717						
Remarks:												

R-1 SHOPPING LIST - Item No. 30

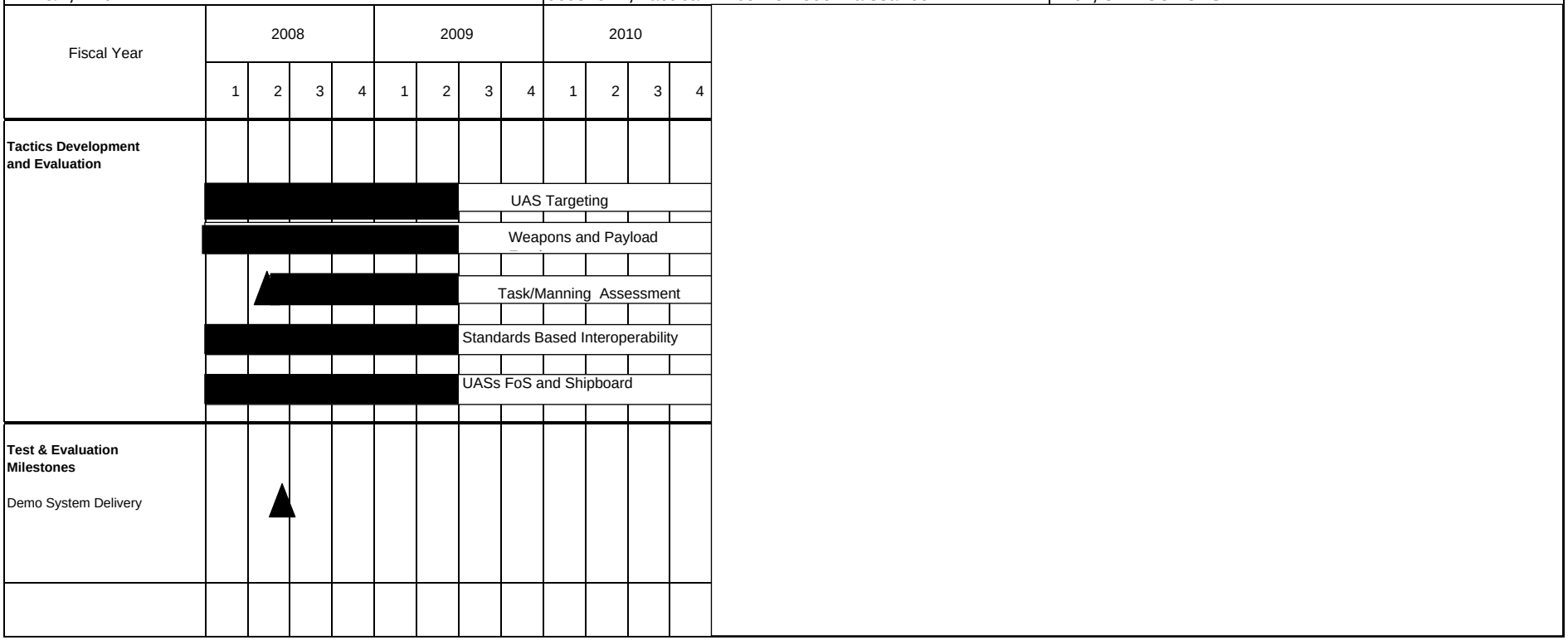
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)													DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603261N, Tactical Airborne Reconnaissance			PROJECT NUMBER AND NAME 2467, UAV CONOPS							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Test and Evaluation													
Interoperability	WX	NAWCWD, China Lake	1.750	0.215	12/08	0.217	12/09						
Live Fire Test & Evaluation													
Test Assets													
Tooling													
GFE													
Award Fees													
Subtotal T&E			1.750	0.215		0.217							
Remarks:													
Contractor Engineering Support													
Government Engineering Support	Various	Various	2.711	0.611	12/08	0.614	12/09						
Program Management Support	Various	Various	1.379	0.356	12/08	0.358	12/09						
Travel	TO	NAVAIR, Pax River	0.329	0.035	10/08	0.035	10/09						
Transportation													
SBIR Assessment													
Subtotal Management			4.419	1.002		1.007							
Remarks:													
Total Cost			30.417	4.243		5.991							
Remarks:													

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2467, UAV CONOPS**	



R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT **0603261N, Tactical Airborne Reconnaissance**				PROJECT NUMBER AND NAME **2467, UAV CONOPS**			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Tactics Development and Evaluation								
UAS Targeting	1Q-4Q	1Q-4Q	1Q-4Q					
Weapons and Payload Employment	1Q-4Q	1Q-4Q	1Q-4Q					
Task and Manning Assessment	2Q-4Q	1Q-4Q	1Q-4Q					
UASs FoS and Shipboard Interoperability	1Q-4Q	1Q-4Q	1Q-4Q					
Test and Evaluation Milestones								
Demo System Delivery	2Q							

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME **0603261N, Tactical Airborne Reconnaissance**				PROJECT NUMBER AND NAME **2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost			**1.722**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is a center of technical excellence to support all Unmanned Air Vehicle (UAV) programs within the services. The mission includes Service-specific and Joint Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance (C4ISR) programs throughout DoD. The JTC/SIL provides a Government test bed for rapid prototyping, technology insertion and transition, systems engineering, modeling/simulation, training and Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) optimization. The cornerstone of JTC/SIL's diverse tool set is the Multiple Unified Simulation Environment (MUSE), which is the Department's simulation/training system of choice for ISR systems, sensors, and platforms.

The Services and Warfighting Commanders have a requirement for the capability to train with a system that provides a real-time simulation environment containing multiple intelligence systems that can be integrated with larger force-on-force simulations. The MUSE creates a realistic operational environment which supports the ability to assess military utility, architecture and CONOPS development, Tactics, Techniques, and Procedures (TTP) development and refinement, conduct emerging concepts experimentation, and C4ISR optimization within warfighting exercises and experiments. It is the only simulation system used by the Combat Commanders and Joint Services to support command and battle staff C4ISR training; there is no alternative available to satisfy those requirements.

The MUSE also creates a realistic operational environment that supports an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle cost and schedule impacts; the ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service-specific warfighting exercises; and C4ISR optimization.

MUSE is currently in use within all services and unified commands simulating Predator, Global Hawk (RQ-4), Hunter, and MCTUAS UAVs (RQ-7), national and commercial satellite collectors, P-3, and the U-2. During warfighting exercises, the JTC/SIL integrates imagery simulations with associated C4ISR systems to support execution of critical imagery processes. For those assets normally not available for training, the JTC/SIL provides surrogate systems and interfaces. Distributed training environments, virtually linking participants from various locations worldwide, are routinely supported within the MUSE architecture. The MUSE is also used as a mission rehearsal tool for current, on-going military combat operations.

Additionally, the JTC/SIL supports a range of materiel developers, integrating prototypes and trainers into the C4ISR and training environments of supported units. The Tactical UAV (TUAV) ground station developed by the JTC/SIL includes an embedded MUSE trainer, and is planned to be incorporated into the MQ-8 Ground Control Station (GCS). Interim training capabilities for the Tactical Exploitation System (TES) are currently employed in the joint exercises.

NOTE: FY 2008 and FY 2009 JTC/SIL are budgeted under PE 0305204N PU 2910. JTC/SIL was realigned to 0603261N beginning FY2010.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**

B. Accomplishments/Planned Program

MUSE Development	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.850	
RDT&E Articles Quantity				

MUSE Development - Continue development of VTUAV model, continue Common Trainer for current platforms, continue to provide C4ISR simulation support to major exercises and demonstrations, complete integration of Tactical Exploitation of National Capabilities (TENCAP) simulation into PC-based MUSE, complete development of virtual Signals Intelligence (SIGINT) platform, continue development of Laser Designator capability, continue upgrade for National Space Assets Enhancements, continue C4I Enhancements, continue initial Fixed Target Damage simulation.

Engineering and Maintenance	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.500	
RDT&E Articles Quantity				

Maintenance, Licenses and Equipment Purchases include the day-to-day maintenance of lab equipment, license maintenance and license renewals from vendors for individual pieces of equipment, purchases of equipment to support the MUSE, and purchases to upgrade the MUSE capability.

Program Management	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.372	
RDT&E Articles Quantity				

Laboratory Sustainment includes government management, contracts administration, cost accounting, configuration management, administrative support of the lab, MUSE architecture development, property management/accountability, and procurement of equipment.

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	**0603261N, Tactical Airborne Reconnaissance**	**2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

Not Applicable

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)									DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4**			PROGRAM ELEMENT **0603261N, Tactical Airborne Reconnaissance**			PROJECT NUMBER AND NAME **2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Primary Hardware Development													
Ancillary Hardware Development													
Aircraft Integration													
Ship Integration													
Ship Suitability													
Systems Engineering													
Training Development													
Licenses													
Tooling													
GFE													
Award Fees													
Subtotal Product Development			0.000	0.000		0.000							
Remarks:													
Development Support													
Software Development	MIPR	JTC/SIL Redstone Arsenal, AL				1.350	02/10						
Integrated Logistics Support													
Configuration Management													
Technical Data													
Studies & Analyses													
GFE													
Award Fees													
Subtotal Support			0.000	0.000		1.350							
Remarks:													

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603261N, Tactical Airborne Reconnaissance			PROJECT NUMBER AND NAME 2910, JOINT TECH CENTER/SYSTEMS INTEG LAB						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation												
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000						
Remarks:												
Contractor Engineering Support												
Government Engineering Support	MIPR	JTC/SIL Redstone Arsenal, AL				0.372	11/09					
Program Management Support												
Travel												
Transportation												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.372						
Remarks:												
Total Cost			0.000	0.000		1.722						
Remarks:												

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:

EXHIBIT R4, Schedule Profile													DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**					PROGRAM ELEMENT NUMBER AND NAME **0603261N, Tactical Airborne Reconnaissance**								PROJECT NUMBER AND NAME **2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**
Fiscal Year	2008				2009				2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
Acquisition **Milestones**													
Test & Evaluation **Milestones**													
Provide MUSE Support to UAV developers													

R-1 SHOPPING LIST - Item No. 30

FY 2008 and FY 2009 JTC/SIL are budgeted under PE 0305204N PU 2910. JTC/SIL was realigned to 0603261N beginning FY2010.

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT **0603261N, Tactical Airborne Reconnaissance**				PROJECT NUMBER AND NAME **2910, JOINT TECH CENTER/SYSTEMS INTEG LAB**			
Schedule Profile	FY 2008	FY 2009	FY 2010					
MUSE Support to UAV Developers			1Q-4Q					

R-1 SHOPPING LIST - Item No. 30

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	9.620	7.121	1.677				
0324 / ADV COMBAT SYSTEM TECHNOLOGY	7.307	4.329	1.677				
9999 / CONGRESSIONAL ADD	2.313	2.792	0.000				

A. MISSION DESCRIPTION:

The Advanced Combat System Technology line provides engineering studies, real time instrumentation, risk reduction experiments conducted in a distributed computer architecture and Tactical Information Management (TIM) concepts in a computing testbed. The program matures both technical and business model integration for warfare systems programs of record in an open architecture environment. A priority is the design of the flow and display of tactical information through the "detect-control-engage" process to provide decision quality information.

Project Unit 0324: Funding is included to ensure all Naval systems, family of systems, and programs move to modular Open Architectures (OA) in accordance with DoDD 5000.1 dated 12 May 2003 which mandates all DoD programs to utilize open systems architecture in order to rapidly field affordable, interoperable systems. By direction of the Navy SAE, PEO IWS is assigned overall responsibility and authority to direct the Navy's OA effort which this project supports. This effort establishes acquisition strategies, develops guidance, and develops analysis of alternatives to determine OA software reuse practices within and across all Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, and C4I). This project also works closely with the Test and Evaluation (T&E) and certification communities in defining regression testing and certification requirements for all OA Commercial Off-the-Shelf upgrades and software reuse applications. Ultimately, this project seeks to create a strategic shift in the acquisition process to facilitate cooperative cross-domain/COI business relationships. This will improve economies of scale throughout the Navy. This development effort will identify the business case and return on investment for moving the Navy towards an open systems approach, support the development of open systems technologies, and integrate best practices for open systems development within Naval acquisition. This Naval OA project will ensure Navy-wide system architectures are extensible and scaleable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, and reuse methodologies. In summary, this funding supports systems engineering required across all Naval systems as they are migrated to function in a joint net centric warfare environment.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	11.515	4.367	10.086
FY10 President's Budget	9.620	7.121	1.677
Total Adjustments	-1.895	2.754	-8.409
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	-0.019	0.000
SBIR/STTR/FTT Assessment	-0.148	0.000	0.000
Program Adjustments	-1.747	2.769	-8.391
Rate/Misc Adjustments	0.000	-0.004	-0.018
Total	-1.895	2.754	-8.409

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
PE 0604307N/ 1447 (AEGIS Surf Combatant Combat Sys Imp)	148.332	187.905	178.457	514.694
PE 0604755N/ 2178 (Ship Self Defense System)	25.946	30.451	25.664	82.061
PE 0603582N/ 0164 (Common Network Interface)	13.550	13.500	0.000	27.050
PE 0603658N/2039 (Cooperative Engagement Capability)	31.060	38.212	56.586	125.858

D. ACQUISITION STRATEGY:

This risk reduction effort evolved and shifted from a PEO IWS 1.0 task to NSWC/Dahlgren to an ASN-RDA directed task to fund the Navy's OA Enterprise effort from this core OA Budget line (policy statement dated 5 August 2004). The strategy was further refined in the DCNO requirement of 23 December 2005 (N6/7) with guidance for this effort to assist the MDA, program managers, and resource sponsors in assessing enterprise program assets where appropriate. OPNAV has directed this program to provide objective, measurable, performance based assessments as baselines for future system changes and spiral developments. It is also directed to serve as the coordinator for end-to-end force level system engineering experiments (e.g., OA/Fn Experiment). Furthermore, it directs an OA asset repository capability that incorporates and enterprise configuration management process be built and maintained.

E. MAJOR PERFORMERS:

NSWC/ Dahlgren - Dahlgren, Virginia - Technical Authority for OA Program for PEO IWS

NSWC Carderock, & ALION- Program Management Support

NAVAIR - OA Domain Support

Industry: IBM, ANGLE

SPAWAR-OA Domain Support

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**				PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	7.307	4.329	1.677				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project Unit 0324: Funding is included to ensure all Naval systems, family of systems, and programs move to modular Open Architectures (OA) in accordance with DoDD 5000.1 dated 12 May 2003 which mandates all DoD programs to utilize open systems architecture in order to rapidly field affordable, interoperable systems. By direction of the Navy SAE, PEO IWS is assigned overall responsibility and authority to direct the Navy's OA effort which this project supports. This effort establishes acquisition strategies, develops guidance, and develops analysis of alternatives to determine OA software reuse practices within and across all Navy Communities of Interest (COI - Surface, Subsurface, Air, Space, and C4I). This project also works closely with the Test and Evaluation (T&E) and certification communities in defining regression testing and certification requirements for all OA Commercial Off-the-Shelf upgrades and software reuse applications. Ultimately, this project seeks to create a strategic shift in the acquisition process to facilitate cooperative cross-domain/COI business relationships. This will improve economies of scale throughout the Navy. This development effort will identify the business case and return on investment for moving the Navy towards an open systems approach, support the development of open systems technologies, and integrate best practices for open systems development within Naval acquisition. This Naval OA project will ensure Navy-wide system architectures are extensible and scaleable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, and reuse methodologies. In summary, this funding supports systems engineering required across all Naval systems as they are migrated to function in a joint net centric warfare environment.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**	PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Change Naval Processes and Business Practices	3.285	2.303	1.677
RDT&E Articles Quantity	0	0	0

Naval Business Practices: This funding supports the required activities of the OA Enterprise Team necessary to change Naval Business Practices including a) the development and refinement of policies, guidance and terminology required to establish a consistent approach for OA across the enterprise; b) the development and maintenance of analytical toolsets (i.e. OA Assessment Tool) to assist the Milestone Decision Authority, PM, and Resource Sponsor in assessing a programs openness, where appropriate, to make informed OA investment decisions; c) the implementation and refinement of OA Contract Guidance to be used in applicable procurements tailored as necessary to meet domain specific requirements; and d) the facilitation of design disclosure and cross-domain component reuse to reduce costs and enable more effective technology insertion including the development of an OA Enterprise Asset Repository Capability that incorporates a common end-user licensing agreement and enterprise configuration management processes that are open and accessible to all Naval and Joint programs and qualified vendors. During FY10 the funding will cover the Software Hardware Asset reuse Enterprise (SHARE) effort. SHARE establishes a functional process and asset repository to publish government owned assets central to the Open Architecture strategy. This repository is key to the health and maturity of the Navy OA effort and serves as a pilot project that will ultimately spiral to an enterprise wide asset.

	FY 2008	FY 2009	FY 2010
OA Systems Engineering Leadership	1.094	0.582	0.000
RDT&E Articles Quantity	0	0	0

Systems Engineering: This funding supports systems engineering collaboration across the enterprise to facilitate the fielding of interoperable capabilities including a) the alignment of PEO architectures (i.e. PEO IWS and PEO C4I); b) conducting system engineering experimentations (e.g. OA/FORCEnet) to increase coordination efficiency and capture activities, products, and artifacts (including DoD artifacts products, UML, Code, Documentations, Tools, and Data) for potential reuse; c) overseeing OA implementation efforts ensuring standardized and disciplined processes are utilized across domains (e.g. standards and interfaces, services); d) identifying and fostering "quick win" candidates and near-term proofs of concept for OPNAV to field additional capabilities at reduced costs; e) working with the S&T community to ensure OA remains relevant and coordinating on emerging technologies; and f) working with the T&E community and academia /industry partners to identify opportunities to reduce T&E expenses as a result of OA.

	FY 2008	FY 2009	FY 2010
Change the Naval and Marine Corps Cultures to Institutionalize OA Principle	1.821	0.868	0.000
RDT&E Articles Quantity	0	0	0

OA Enterprise Communications and Training: This funding supports the activities to enable the cultural adoption of OA principles and practices through stakeholder management, communications, training, and OA Knowledge Management. Key activities include the development on an enterprise workforce training and education program and establishment of professional curricula (OA modular acquisition and OA systems engineering) with academia and Naval Institutes. This program plan includes participation, liaison, and coordination with multiple stakeholders including the OSD Open Systems Joint Task Force (OSJTF), Naval Post Graduate School, Defense Acquisition University (DAU), FORCEnet, Industry Days, and other communication vehicles, to ensure the optimal OA standards and technologies are identified and incorporated into Naval system acquisition.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**	PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**	

	FY 2008	FY 2009	FY 2010
Align the Naval Enterprise Across All Domains to Implement OA	1.107	0.576	0.000
RDT&E Articles Quantity	0	0	0

OA Enterprise Alignment: This funding supports the preparation and execution of the quarterly OA Executive Team Lead Council meetings and reporting requirements of the OA Executive Team (OAET). Specifically, this includes OA Executive Committee reporting of action items to DASN, monthly reports from the OA Chairman, fleet bi-weekly reports, report to Congress, quarterly domain execution reports, coordinating with OPNAV to review SPII efforts, as well as the annual OA budget submission and financial reporting for this project. Alignment across the Enterprise also includes the development and management of Implementation Roadmaps to ensure integration.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**					PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**					
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
SE/OA Domain Support	SS/CPFF	APL / Baltimore, MD	0.950			0.000		0.000			0.950	0.000
Systems Engineering	WR	NSWC / Dahlgren, VA	9.453			1.962	OCT-08	1.677	NOV-09		CONT	0.000
Systems Engineering	WR	NSWC/CRANE & Carderock	1.835			0.127	NOV-08	0.000			2.374	0.000
Systems Engineering	CPAF	Miscellaneous	4.491			0.940	NOV-08	0.000			5.456	0.000
OA DOMAIN SUPPORT	WR	NUWC/Newport, Spawar, Navair	12.386			0.000		0.000			12.386	0.000
SE/Signal Processor	CPAF	Lockheed Martin	6.000			0.000		0.000			6.000	0.000
SE/Signal Processor	CPAF	BAE	0.300			0.000		0.000			0.300	0.000
SE/Signal Processor	CPAF	Raytheon	0.100			0.000		0.000			0.100	0.000
SE/Signal Processor	WR	NSWC/DD, NRL, PHD	0.600			0.000		0.000			0.600	0.000
Subtotal Product Development			**36.115**			**3.029**		**1.677**			**CONT**	**0.000**
Remarks:												
Industry Development	CPFF	IBM, ANGLE	7.114			1.000	OCT-08	0.000			9.908	0.000
Technical Data-Academia	WR	NPS-Monterey/DAU	1.598			0.000	NOV-08	0.000			2.337	0.000
Software Development	CPFF	MITRE, SEI	0.309			0.000		0.000			0.309	0.000
Subtotal Support Costs			**9.021**			**1.000**		**0.000**			**12.554**	**0.000**
Remarks:												
Operational Test & Evaluation	WR	NSWC/DD	2.416			0.000		0.000			2.416	0.000
OA Asset Repository (SBIR Account)	WR	Miscellaneous	0.150			0.000		0.000			0.150	0.000
Subtotal Test and Evaluation			**2.566**			**0.000**		**0.000**			**2.566**	**0.000**
Remarks:												
Program Management Support	CPAF	Miscellaneous	2.777			0.300	NOV-08	0.000			CONT	0.000
SBIR Assessment (Cong Add)	CPAF	NSWC/DD	2.435			0.000		0.000			4.748	0.000
Subtotal Management Services			**5.212**			**0.300**		**0.000**			**CONT**	**0.000**
Remarks:												
Total Cost			**52.914**			**4.329**		**1.677**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4, SCHEDULE PROFILE			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**	PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**	

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones												
Incorporate OA Principles in Strategies, Contracts, Reviews, Requirements, & Other Documentation	△	△	△	△	△	△	△	△	△	△	△	△
Change Culture through OA Education, Outreach, & Training	△	△	△	△	△	△	△	△	△	△	△	△
OA Collaboration with Information Technology Management Council	△	△	△	△	△	△	△	△	△	△	△	△
Adapt ONR Technologies	△	△	△	△	△	△	△	△	△	△	△	△
Conduct Program Assessments	△	△	△	△	△	△	△	△	△	△	△	△
Update Naval OA/FN Technical Stds	△		△									
Publish Contract Guidebook Update				△				△				△
Host Contracting/Industry Symposium					△				△			
Deliver Report to Congress	△	△	△	△	△	△	△	△	△	△	△	△
Conduct Lifecycle Affordability Pilot			△	△	△	△	△	△				
Host OA Lead Council Meetings	△	△	△	△	△	△	△	△	△	△	△	△
OA Enterprise Asset Repository	△	△	△	△	△	△	△	△	△	△	△	△
Test & Evaluation Milestones												
Production Milestones												
Deliveries												

* Not required for Budget Activities 1, 2, 3, and 6

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4a, SCHEDULE DETAIL			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**		PROJECT NUMBER AND NAME **0324/ADV COMBAT SYSTEM TECHNOLOGY**

Schedule Profile	FY 2008	FY 2009	FY 2010
Incorporate OA Principles in Acquisition Strategies and Contracts	1-4Q	1-4Q	1-4Q
Change Culture through OA Education, Outreach and Training	1-4Q	1-4Q	1-4Q
OA Collaboration with Information Technology Management Council	1-4Q	1-4Q	1-4Q
Adapt ONR Technologies	1-4Q	1-4Q	1-4Q
Conduct Program Assessments	1-4Q	1-4Q	1-4Q
Naval OA/Fn Technical Stds Profiles	1Q/3Q		
Publish Contract Guidebook Update	4Q	4Q	4Q
Host Contracting/Industry Symposium		1Q	1Q
Deliver Report to Congress	1-4Q	1-4Q	1-4Q
Conduct Lifecycle Affordability Pilot	3-4Q	1-4Q	
OA Lead Council Meeting	1-4Q	1-4Q	1-4Q
OA Enterprise Asset Repository Updates	1-4Q	1-4Q	1-4Q

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603382N/ADVANCED COMBAT SYSTEMS TECHNOLOGY**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADD**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9999N Open Arch/Maint Free Operating Period (OA/MFOP)	0.000	2.792	0.000
RDT&E Articles Quantity	0	0	0

Open Architecture/Maintenance Free Operating Period (MFOP) - This funding will provide engineering, technical, and support services to the Open Architecture Program. The initial program for transitioning into the Surface Domain programs of record the MFOP lessons learned and tools derived from the AN/BSY-10 2004-2005 pilot co-sponsored with ASN (RD&A). MFOP incorporates processes, software tools and Commercial Off-The-Shelf (COTS) hardware redundancy used in open-architected systems such that the system self-checking and self-healing capabilities virtually eliminates at-sea open cabinet maintenance and improve Operational Availability (OA). This funding also extends the application of OA/MFOP and investigates the adoption of the MFOP tools to other National Security Systems as an OA reusable component, leveraging lessons learned from the submarine MFOP program; including secure interoperability (IA) of electronic based acoustics and non-acoustics combat weapons systems and subsystems.

	FY 2008	FY 2009	FY 2010
9429A Open Architecture/MFOP	2.313	0.000	0.000
RDT&E Articles Quantity	0	0	0

Open Architecture/Maintenance Free Operating Period (MFOP) - This funding supports the pilot program for AN/BSY-10, co-sponsored with ASN (RDA), it incorporates software tools and hardware redundancy into Commercial Off-The-Shelf (COTS) based open architected systems such that the system self-checking and self-healing capabilities virtually eliminate at-sea open cabinet maintenance. This funding extends the application of OA/MFOP to investigate the adoption of MFOP tools in other Navy National Security Systems as an OA reusable component.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASUR**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	88.432	123.022	76.739				
0260 / REMOTE MINEHUNTING SYSTEMS	8.500	0.000	5.931				
1233 / Surface MCM Mid-life Upgrade	27.470	25.155	21.469				
2094 / Unmanned Underwater Vehicle	12.637	27.053	0.000				
2131 / Assault Breaching System	25.653	43.886	30.871				
3123 / SMCM UUV	7.518	12.610	15.610				
4025 / Expendable Mine Neutralization System	6.654	7.139	2.858				
9179A / Unmannned Undersea Vehicles Near Term Interim Capa	0.000	3.988	0.000				
9967A / AN/SQQ-32 Mine Hunting Sonar Upgrade	0.000	3.191	0.000				

A. MISSION DESCRIPTION:

The program provides for developments to combat the threat of known and projected foreign mines against U.S. Naval and merchant shipping in harbors, channels, choke points, sea lines of communications and amphibious and other fleet operating areas. It develops: (1) organic remote minehunting capability for surface platforms; (2) the integration and improvement of systems and support for systems which will detect, localize, classify, and neutralize moored, bottom, and close-tethered mines for use in Mine Countermeasure (MCM) MCM-1 Class and other surface ships; (3) systems for neutralizing mines and light obstacles from shallow water, very shallow water, surf zones, and beach landing craft zones in support of amphibious operations; (4) Unmanned Undersea Vehicle (UUV) systems for clandestine mine reconnaissance.

Congressional plus-up for the Surface Navy Integrated Undersea Tactical Technology (SNIUTT) was used to develop an AN/SQQ-32, AN/AQS-14, AN/AQS-24 and AN/AQS-20A sensor training module for a LAN-based Surface Network Embedded Analysis and Tactical Trainer (SNEATT).

Congressional plus-up for the ANSQQ-32 Mine Hunting Sonar development for High Frequency Wide Band.

(U) B. JUSTIFICATION FOR BUDGET ACTIVITY:

This program is funded under DEMONSTRATION AND VALIDATION because it develops and integrates hardware for experimental testing related to specific ship or aircraft applications.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASUR**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	89.175	119.164	135.420
FY10 President's Budget	88.432	123.022	76.739
Total Adjustments	-0.743	3.858	-58.681
(U) Summary of Adjustments			
Congressional Rescissions		-0.334	
Congressional Adjustments		7.200	
SBIR/STTR/FTT Assessment	-0.743		
Program Adjustments		-2.935	-57.372
Rate/Misc Adjustments		-0.073	-1.309
Total	-0.743	3.858	-58.681

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **0260/REMOTE MINEHUNTING SYSTEMS**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	8.500	0.000	5.931				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The AN/WLD-1(V)(1), Remote Minehunting System (RMS), consists of a diesel powered semi-submersible Remote Multi-Mission Vehicle (RMMV) that tows a Variable Depth Sensor (VDS, AN/AQS-20A). It also includes shipboard equipment consisting of a command control combat system, launch and recovery system, radio antennas and support equipment. RMS can operate from the DDG-51 Class Flight IIA ships (DDG-91-96) and Littoral Combat Ships (LCS). The system determines the presence or absence of mines to an acceptable level of confidence to enable ships to operate in or avoid specific areas. Future funding will be used to begin development of emerging technologies for incorporation into the AN/WLD-1(V)(1) Remote Minehunting System and Littoral Combat Ship (LCS) Reconfigurable Mission Capabilities (Multi-Mission - MM).

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**0260/REMOTE MINEHUNTING SYSTEMS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.500	0.000	3.918
RDT&E Articles Quantity	0	0	0

Product Development:

FY08: RMMV fixes in support of OPEVAL.

FY10: Develop Spiral Upgrade - Block 1 which includes Forward Electronic Section, Vehicle Upgrade and Automatic Obstacle Avoidance.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	1.513
RDT&E Articles Quantity	0	0	0

Support:

FY10: Provide engineering, logistic and programmatic support for RMMV Spiral Upgrade development.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	5.750	0.000	0.000
RDT&E Articles Quantity	0	0	0

T&E:

FY 08: Conduct DT-IIE/F in Jul 08 and OPEVAL in Sep 08 on DDG-96.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.250	0.000	0.500
RDT&E Articles Quantity	0	0	0

Management:

FY 08: Update documentation in support of Full Rate Production Decision Travel.

FY10: Provide program management and travel for RMMV Spiral Upgrade development.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**0260/REMOTE MINEHUNTING SYSTEMS**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
2622 / OPN (LV064)	14.500	2.820	4.806	22.126
1600 /OPN (LCS MM)	0.000	22.196	22.600	44.796

D. ACQUISITION STRATEGY:

The RMS(V)3 focused on a prototype development, and was competitively awarded to Lockheed Martin in August 1996. The RMS(V)4, officially designated the AN/WLD-1(V)(1), was awarded as a sole source contract to Lockheed Martin in 2002. MS C on 1 July 2005 authorized procurement of three (3) LRIPs in FY05. Conducted Operational Assessment in August 2006 to support FY06 (2nd) LRIP Decision. ASN(RDA) approved FY06 (2nd) LRIP up to 4 units. This decision was documented in Acquisition Decision Memorandum (ADM) dated 21 Sep 2006. The Program Decision Memorandum (PDM) authorizing production of LRIP #8, FY08 LRIP Option was issued by ASN(RDA) on 2 Apr 08. An Operational Assessment (OA) was conducted in 4th Qtr FY08.

E. MAJOR PERFORMERS:

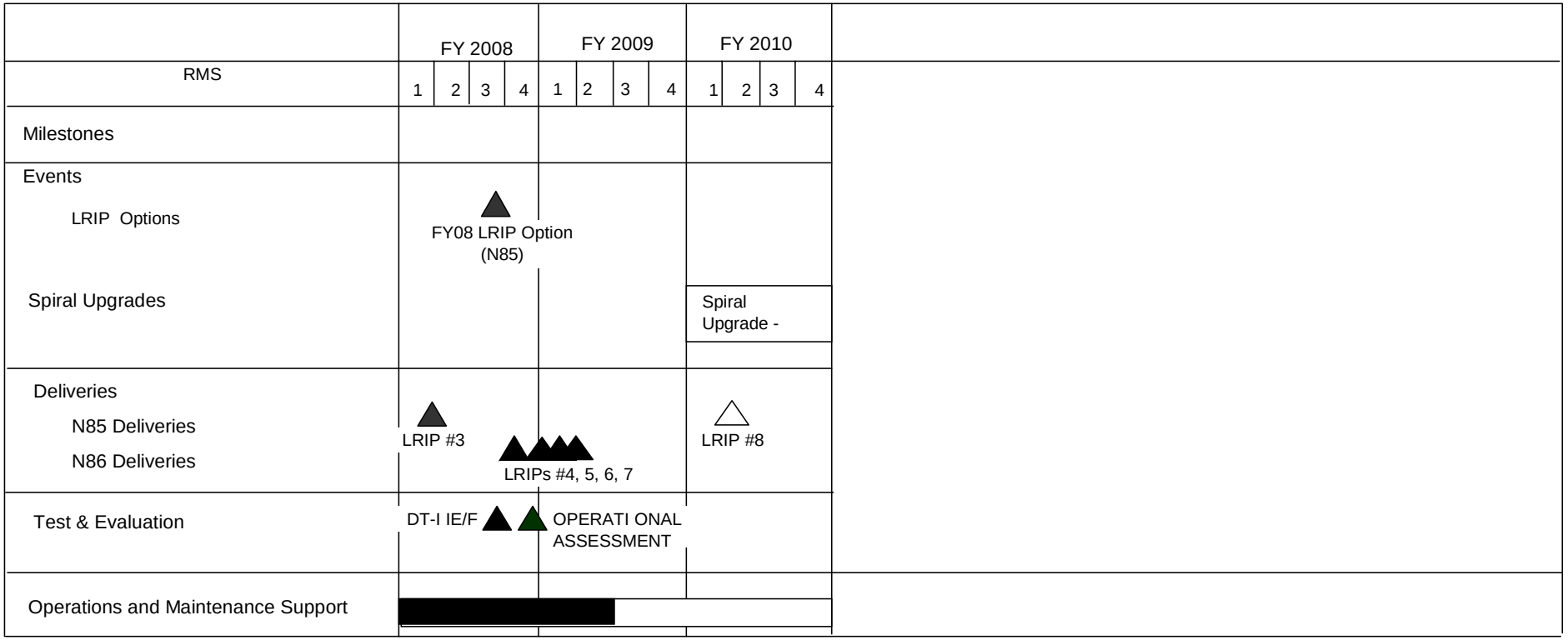
Major performers are Lockheed Martin, COMOPTEVFOR, NAVSEA and NSWC PC.

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **0260/REMOTE MINEHUNTING SYSTEMS**						
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
Hardware Development & Integration	CPIF	Lockheed Martin	97.283			0.000		0.000			97.283	0.000
Hardware Development & Integration	CPIF	Lockheed Martin	95.993			0.000		0.000			95.993	0.000
Hardware Development & Integration	WX	NSWC, PC	7.140			0.000		0.000			7.140	0.000
Systems Engineering	CPIF	Lockheed Martin	5.465			0.000		0.000			5.465	0.000
Systems Engineering	CPIF	Lockheed Martin	8.986			0.000		3.750	DEC-09		12.736	0.000
Systems Engineering	WX	NSWC, PC	2.185			0.000		0.168	NOV-09		2.353	0.000
Award Fees	CPIF	Lockheed Martin	5.485			0.000		0.000			5.485	0.000
Subtotal Product Development			**222.537**			**0.000**		**3.918**			**226.455**	**0.000**
Remarks:												
Software Development	CPIF	Lockheed Martin	7.092			0.000		0.000			7.092	0.000
Software Development	CPIF	Lockheed Martin	6.961			0.000		0.000			6.961	0.000
Software Development	WX	NSWC, PC	2.142			0.000		0.000			2.142	0.000
ILS	CPIF	Lockheed Martin	5.682			0.000		0.000			5.682	0.000
ILS	CPIF	Lockheed Martin	11.404			0.000		0.750	DEC-09		12.154	0.000
ILS	WX	NSWC, PC	3.557			0.000		0.500	NOV-09		4.057	0.000
ILS	Var	Various	1.125			0.000		0.000			1.125	0.000
Ship Integration	CPIF	Lockheed Martin	1.258			0.000		0.000			1.258	0.000
Ship Integration	CPIF	Lockheed Martin	11.938			0.000		0.000			11.938	0.000
Ship Integration	Var	Various	13.451			0.000		0.263	JAN-10		13.714	0.000
Subtotal Support Costs			**64.610**			**0.000**		**1.513**			**66.123**	**0.000**
Remarks:												
Developmental Test & Evaluation	CPIF	Lockheed Martin	18.470			0.000		0.000			18.470	0.000
Developmental Test & Evaluation	CPIF	Lockheed Martin	26.359			0.000		0.000			26.359	0.000
Developmental Test & Evaluation	WX	NSWC, PC	10.792			0.000		0.000			10.792	0.000
Developmental Test & Evaluation	WX	COTF	0.360			0.000		0.000			0.360	0.000
Developmental Test & Evaluation	Var	Various	8.252			0.000		0.000			8.252	0.000
Subtotal Test and Evaluation			**64.233**			**0.000**		**0.000**			**64.233**	**0.000**

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**					PROJECT NUMBER AND NAME **0260/REMOTE MINEHUNTING SYSTEMS**					
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:												
Contractor Engineering Support	CPIF	Lockheed Martin	6.569			0.000		0.000			6.569	0.000
Government Engineering Support	WX	NSWC, PC	22.996			0.000		0.000			22.996	0.000
Government Engineering Support	WX	NSWC, PC	0.137			0.000		0.050	NOV-09		0.187	0.000
Program Management Support	CPFF	CACI	4.583			0.000		0.000			4.583	0.000
Travel	PD	NAVSEA	0.591			0.000		0.050	NOV-09		0.641	0.000
SBIR Assessment	Var	Various	6.361			0.000		0.400	JAN-10		6.761	0.000
Subtotal Management Services			**41.237**			**0.000**		**0.500**			**41.737**	**0.000**
Remarks:												
Total Cost			**392.617**			**0.000**		**5.931**			**398.548**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **0260/REMOTE MINEHUNTING SYSTEMS**

AN/WLD-1(V)(1) PROGRAM SCHEDULE



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERME**			PROJECT NUMBER AND NAME **0260/REMOTE MINEHUNTING SYSTEMS**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
N85 Deliveries	1Q		2Q				
N86 Deliveries	4Q	1Q-2Q					
FY 08 LRIP	3Q						
Spiral Upgrade - Block I			1Q-4Q				
OT-IIB - DDG Opeval	4Q						
DT-II E/F - Techeval	3Q						
Operations and Maintenance Support	1Q-4Q	1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	27.470	25.155	21.469				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(1) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFWB) is a technology upgrade to the SQQ-32 Towed Body which will incorporate HFWB technology into the detection sonar to address performance deficiencies against new mine threats in the littorals. This upgrade will be installed on MCM-1 Class ships with the SQQ-32(V)3 and will develop new transducer modules, fiber optic cable and modify topside processing and display software. 2) Mine Warfare and Environmental Decision Aids Library (MEDAL) is a software segment on the Global Command and Control System Maritime (GCCS-M). MEDAL provides mine and mine warfare planning and evaluation tools and databases to the MCM Commander. 3) Develop and implement Mine Countermeasures Commander's Estimate of the Situation (MCM CES). 4) Unmanned Surface Sweep System (US3) is a magnetic/acoustic sweep system developed to sweep acoustic/magnetic influence mines from an unmanned surface platform deployed from the Littoral Combat Ship (LCS).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.364	0.060	0.152
RDT&E Articles Quantity	0	0	0

MCM CES/PRODUCT DEVELOPMENT:

FY 08: Development of MEDAL EA, Integration of modules of MCM CES Build 0.
FY 09 - FY 10: Development of CES functionality in a MEDAL EA environment.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.600	0.100	0.076
RDT&E Articles Quantity	0	0	0

MCM CES/SUPPORT:

FY08 - FY 10: Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness in reducing the complexity of the MCM planning problem into a manageable set of options depending on the operational objective. Support effort to include communication with activities such as ONR and NSWC-PC to coordinate the incorporation of validated algorithms and models into MEDAL with the CES framework in order to effectively simplify the MCM planning problem for CSG and ESG staffs and therefore provide the speed, agility, adaptability, and flexibility required for modern MCM operations. Validate Fleet usability of Planning on Risk (PoR) module.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.120	0.127
RDT&E Articles Quantity	0	0	0

MCM CES/TEST AND EVALUATION:

FY 09: Complete testing of Build 1 with MEDAL EA.
FY 10: Conduct integration testing with MEDAL EA v1.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.080	0.020	0.026
RDT&E Articles Quantity	0	0	0

MCM CES/MANAGEMENT:

FY 08 - FY10: Program management shall include overall technical guidance and leadership for the program. Other ongoing PM support includes oversight of financial and

logistics efforts and adequate coordination with MEDAL. Other PM tasking to include briefings, demonstrations, and project planning as required.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	6.201	1.632	2.500
RDT&E Articles Quantity	0	0	0

HFWB/PRODUCT DEVELOPMENT:

FY 08: Fiber optic tow cable for EDM; consoles hardware; shipboard equipment system integration and fiber optic and slip ring integration. Continue design and fabrication efforts; begin laboratory integration, testing and in-water component tests.

FY 09: Towed body; common navigation console and auxiliary equipment integration.

FY 10: Began system engineering and requirements analysis for HFWB P3I effort.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.198	0.500	0.370
RDT&E Articles Quantity	0	0	0

HFWB/SUPPORT:

FY 08: Complete software requirements and configuration; software integration testings and ILS documentation.

FY 09: Complete documentation development and ILS documents.

FY 10: Began software requirements, configuration, and software integration for P3I effort.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.958	2.416	0.100
RDT&E Articles Quantity	0	0	0

HFWB/TEST AND EVALUATION:

FY 08: Cabling testing; system integration lab test; tow cable and slip ring shock test and in water testing.

FY 09: Complete in water testing; At sea testing; operation assessment and Environmental Qualification testing (EQT).

FY 10: Perform lab testing for HFWB P3I effort.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.701	0.260	0.158
RDT&E Articles Quantity	0	0	0

HFWB/MANAGEMENT:

FY 08- FY 10: Provide program management support and travel for AN/SQQ-32 High Frequency Wideband (HFWB) Upgrade program.

	FY 2008	FY 2009	FY 2010

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**1233/Surface MCM Mid-life Upgrade**	
Accomplishments/Effort/Subtotal Cost	5.886	6.000	5.168
RDT&E Articles Quantity	0	0	0

MEDAL/PRODUCT DEVELOPMENT:

FY 08: Initiate development of Enterprise Architecture (EA) v.1. Complete Iteration 1 and initiate Iteration 2 and 3.

FY 09: Complete Iteration 2 and 3. Initiate Iteration 4 and 5.

FY 10 : Complete Iteration 4 and 5. Complete development and test of EA v1 and initiate development of EA v2. Complete IOC EA v1.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.402	0.400	0.463
RDT&E Articles Quantity	0	0	0

MEDAL/SUPPORT:

FY 08 - FY 10: Oversee technical integration of developed algorithms and models that have demonstrated their effectiveness with respect to their objectives. Support effort to include communication with activities such as applied labs, government activities, and designated contractors. Assist in providing the speed, agility, adaptability, and flexibility required for modern MCM operations.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.250	0.130	1.322
RDT&E Articles Quantity	0	0	0

MEDAL/TEST AND EVALUATION:

FY 08: Develop and improvement of MEDAL EA test and evaluation strategy. Conduct Development Test (DT) on Iteration 1.

FY 09: Conduct DT on Iteration 2 and 3.

FY 10: Conduct DT on Iteration 4 and 5.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.570	0.570	0.617
RDT&E Articles Quantity	0	0	0

MEDAL/MANAGEMENT:

FY 08 - FY 10: Provide program management support and travel for MEDAL program. Program management shall include overall technical guidance and leadership for the program. Oversight of financial and logistics efforts and coordination with Navy and other DoD organizations and contractors as required to ensure successful execution of the program. As part of the systems engineering element of PM, communicate and coordinate with MIW C4ISR, ICWS, Organic MCM, Mainstreaming MIW, Expeditionary Warfare C4ISR, tactics development, long term planning, Naval Special Clearance Team (NSCT)-1, Assault Breaching Systems of Systems (ABSoS), LCS, and other programs as they relate to MEDAL and MIW Mission Planning, Evaluation, and C4ISR. Other PM tasking to include briefings, demonstrations, and project planning as required.

	FY 2008	FY 2009	FY 2010

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**1233/Surface MCM Mid-life Upgrade**	
Accomplishments/Effort/Subtotal Cost	3.498	4.639	2.184
RDT&E Articles Quantity	0	0	0

US3/PRODUCT DEVELOPMENT:

FY 08: Delivery of AoA; Initiation of capability production document; system development and demonstration effort.

FY 09: Product improvement efforts. Hardware and Software Development for the Unmanned Surface Sweep System (US3).

FY 10: Final design changes, documentation updates, developmental testing and operational testing.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.897	5.667	3.365
RDT&E Articles Quantity	0	0	0

US3/SUPPORT:

FY 08: Engineering support for prototype system and accomplishments of key performance parameters.

FY 09: Engineering and ILS support for required documentation to accomplish Milestone C.

FY 10: Completion of Milestone C documentation; engineering support for test events. Support for programmatic and logistical documentation.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.895	1.398	3.756
RDT&E Articles Quantity	0	0	0

US3/TEST AND EVALUATION:

FY 08: Risk Reduction Testing

FY 09: CT and DT planning

FY 10: Conduct DT testing in 2nd Qtr and OT testing in 3rd Qtr.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.970	1.243	1.085
RDT&E Articles Quantity	0	0	0

US3/MANAGEMENT:

FY 08: Program initiation.

FY 09: Program support and management necessary to monitor contractor progress; review system capabilities; monitor cost and schedule; monitor contractor deliverables.

FY 10: Complete Milestone C in 4th Qtr; award Low Rate Initial Production (LRIP).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
2622/OPN (LV075/LV078/LV080)	12.070	14.874	42.960	69.904

D. ACQUISITION STRATEGY:

HFWB - Naval Surface Warfare Center, Panama City (NSWC, PC) will team with a ARL UT to design and develop the HFWB upgrade to the AN/SQQ-32.

Mine Warfare and Environmental Decision Aids Library (MEDAL) - requirements for MEDAL Builds are generated through a formal requirements process. Requirements conferences gather a list of candidate functions based on a logical sequence to fully implement the overall software architecture. The fleet is presented with a recommended list of candidate capabilities based on this program plan, doctrine, fleet comments, and technology. These capability items are then prioritized by the fleet representatives (coordinated by Commander Mine Warfare Command). The fleet inputs are then consolidated by COMINEWARCOM into an overall list which is then presented to Navy leadership for pricing and final selection. The selection is based on price, risk, available funding, and possibly by other program factors (e.g., ensure that MEDAL supports other program delivery schedules). Selection balances immediate needs, long term objectives, technical maturity and other programmatic factors. A verification and validation process is applied to any algorithms, tactics, or models to be incorporated in the software. MEDAL development to include integration of data fusion techniques and incorporation of Data Access Layer (DAL) architecture to meet FORCEnet requirements. Acquisition strategy for Mine Countermeasures Commander's Estimate of the situation (MCM CES) is to deliver the software module within MEDAL builds by implementing the CES framework into the MEDAL software.

US3- The Unmanned Surface Sweep (US3) system effort was transferred from ONR to PMS495 in FY07. PMS495 will award an SD&D contract to continue development of the system. It will be capable of sweeping mines in the littoral waters. The SD&D phase will include a Milestone C LRIP decision in FY10.

E. MAJOR PERFORMERS:

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**						
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
BSP: Develop Bottom Sediment Classifier	WX	NRL	0.258			0.000		0.000			0.258	0.000
Systems Engineering and Integration	WX	NSWC PC	0.306			0.000		0.000			0.306	0.000
System Development	WX	NSWC PC	0.373			0.000		0.000			0.373	0.000
Subtotal Product Development			**0.937**			**0.000**		**0.000**			**0.937**	**0.000**
Remarks:												
Develop Logistics Products	WX	NSWC PC	0.160			0.000		0.000			0.160	0.000
Subtotal Support Costs			**0.160**			**0.000**		**0.000**			**0.160**	**0.000**
Remarks:												
Program Management Support	CPFF	CACI	0.080			0.000		0.000			0.080	0.000
Government Engineering Support	WX	NSWC PC	0.090			0.000		0.000			0.090	0.000
Travel	PD	NAVSEA	0.256			0.000		0.000			0.256	0.000
Subtotal Management Services			**0.426**			**0.000**		**0.000**			**0.426**	**0.000**
Remarks:												
Systems Engineering	WX	NSWC PC	2.915			0.000		0.000			2.915	0.000
Subtotal C4I Production Development			**2.915**			**0.000**		**0.000**			**2.915**	**0.000**
Remarks:												
Software Development	CPFF	SAIC	0.350			0.000		0.000			0.350	0.000
Subtotal C4I Support			**0.350**			**0.000**		**0.000**			**0.350**	**0.000**
Remarks:												
Program Management Support	CPFF	CACI	0.263			0.000		0.000			0.263	0.000
Travel	PD	NAVSEA	0.084			0.000		0.000			0.084	0.000
Government Engineering Support	WX	NSWC PC	0.271			0.000		0.000			0.271	0.000
Program Management Support	Var	Various	0.157			0.000		0.000			0.157	0.000
SBIR Assessment			0.019			0.000		0.000			0.019	0.000

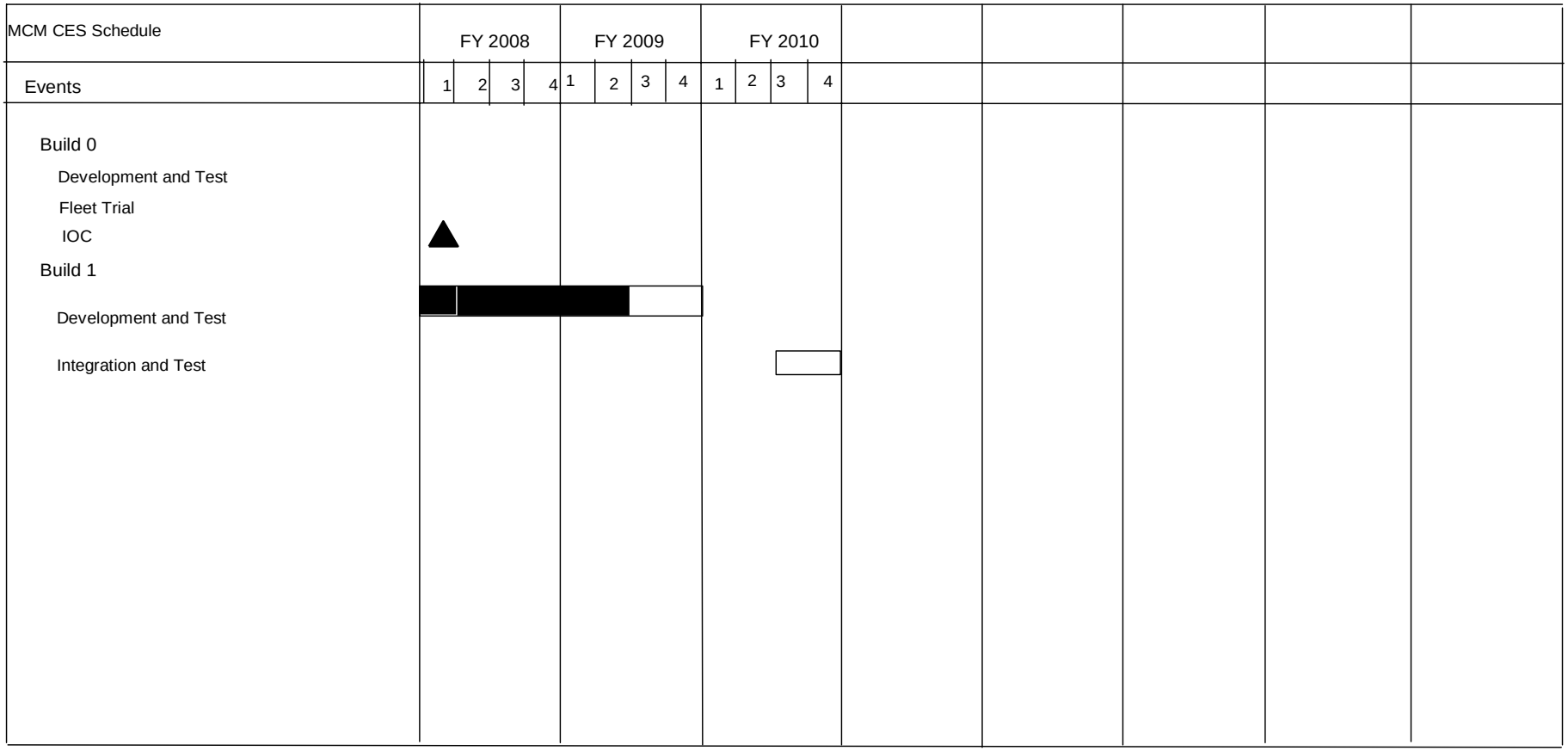
CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**						
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
Subtotal C4I Management			**0.794**			**0.000**		**0.000**			**0.794**	**0.000**
Remarks:												
Systems Engineering	WX	NSWC PC	1.440			0.060	NOV-08	0.152	NOV-09		1.652	0.000
Subtotal MCM CES Product Development			**1.440**			**0.060**		**0.152**			**1.652**	**0.000**
Remarks:												
Software Development	CPFF	SAIC	1.269			0.000		0.076	NOV-09		1.345	0.000
Subtotal MCM CES Support			**1.269**			**0.000**		**0.076**			**1.345**	**0.000**
Remarks:												
Test and Evaluation	Var	Various	0.100			0.220	NOV-08	0.127	NOV-09		0.447	0.000
Subtotal MCM CES Test and Evaluation			**0.100**			**0.220**		**0.127**			**0.447**	**0.000**
Remarks:												
Program Management Support	CPFF	CACI	0.145			0.020	NOV-08	0.026	NOV-09		0.191	0.000
Government Engineering Support	WX	NSWC PC	0.015			0.000		0.000			0.015	0.000
Travel	PD	NSWC PC	0.094			0.000		0.000			0.094	0.000
Subtotal MCM CES Management			**0.254**			**0.020**		**0.026**			**0.300**	**0.000**
Remarks:												
Primary Hardware Development	VAR	NSWC PC/ARL UT	14.354			1.232	NOV-08	0.000			15.586	0.000
Primary Hardware Development	WX	ARL-UT	0.000			0.000		0.000			0.000	0.000
Tow Cable Development	VAR	NSWC PC/ARL UT	1.399			0.000		0.000			1.399	0.000
Ship Integration	WX	NSWC PC	1.297			0.400	NOV-08	0.000			1.697	0.000
SYSTEM ENGINEER	VAR	NSWC/ARL UT	0.000			0.000		2.500	NOV-09		2.500	0.000
Subtotal HFWB Product Development			**17.050**			**1.632**		**2.500**			**21.182**	**0.000**
Remarks:												

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**					PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**					
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
HFWB Software Development	WX	NSWC PC/ARL-UT	5.915			0.250	NOV-08	0.300	NOV-09		6.465	0.000
HFWB Integrated Logistics Support	WX	NSWC PC	2.350			0.250	NOV-08	0.070	NOV-09		2.670	0.000
Subtotal HFWB Support			**8.265**			**0.500**		**0.370**			**9.135**	**0.000**
Remarks:												
Developmental Test and Evaluation	WX	NSWC PC/ARL-UT	1.483			2.416	NOV-08	0.100	NOV-09		3.999	0.000
Subtotal HFWB Test and Evaluation			**1.483**			**2.416**		**0.100**			**3.999**	**0.000**
Remarks:												
Program Management Support	Var	Various	0.944			0.150	JAN-09	0.148	JAN-10		1.242	0.000
Government Engineering Support	WX	NSWC PC	0.650			0.100	NOV-08	0.000			0.750	0.000
Travel	PD	NAVSEA	0.030			0.010	NOV-08	0.010	NOV-09		0.050	0.000
Subtotal HFWB Management			**1.624**			**0.260**		**0.158**			**2.042**	**0.000**
Remarks:												
Software Development	CPFF	SAIC	16.853			6.000	NOV-08	5.168	NOV-09		28.021	0.000
Subtotal MEDAL Product Development			**16.853**			**6.000**		**5.168**			**28.021**	**0.000**
Remarks:												
Software Engineering	WX	SPAWAR	0.364			0.182	NOV-08	0.208	NOV-09		0.754	0.000
Software Engineering	WX	NSWC PC	0.440			0.218	NOV-08	0.255	NOV-09		0.913	0.000
Subtotal MEDAL Support			**0.804**			**0.400**		**0.463**			**1.667**	**0.000**
Remarks:												
Test and Evaluation	Var	Various	0.750			0.130	NOV-08	1.322	DEC-09		2.202	0.000
Subtotal MEDAL Test and Evaluation			**0.750**			**0.130**		**1.322**			**2.202**	**0.000**
Remarks:												
Program Management Support	CPFF	CACI	0.930			0.245	NOV-08	0.265	FEB-10		1.440	0.000

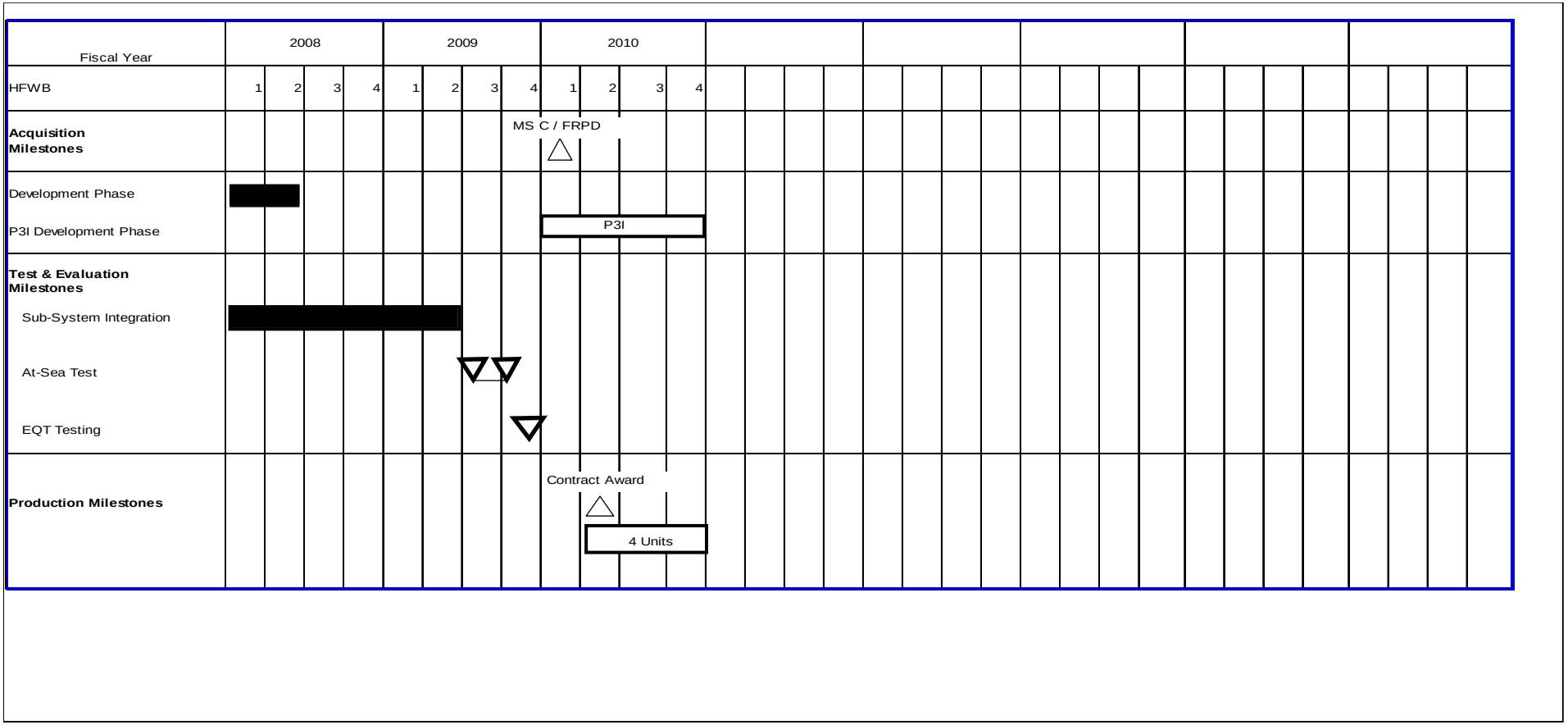
CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**					PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**					
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
Government Engineering Support	WX	NSWC PC	0.896			0.300	NOV-08	0.327	NOV-09		1.523	0.000
Travel	PD	NAVSEA	0.189			0.025	NOV-08	0.025	NOV-09		0.239	0.000
SBIR Assessment			0.054			0.000		0.000			0.054	0.000
Program Management Support	Var	Various	0.350			0.000		0.000			0.350	0.000
Subtotal MEDAL Management			**2.419**			**0.570**		**0.617**			**3.606**	**0.000**
Remarks:												
Product Development	TBD	ITT	3.472			3.455	NOV-08	2.000	DEC-09		8.927	0.000
Product Development	WX	NSWC PC	0.118			1.184	NOV-08	0.184	NOV-09		1.486	0.000
Subtotal US3 Product Development			**3.590**			**4.639**		**2.184**			**10.413**	**0.000**
Remarks:												
Engineering	TBD	ITT	0.257			1.477	NOV-08	0.800	DEC-09		2.534	0.000
Integrated Logistics	TBD	ITT	0.205			0.979	NOV-08	0.429	DEC-09		1.613	0.000
Engineering	WX	NSWC PC	1.909			2.071	NOV-08	1.330	NOV-09		5.310	0.000
Integrated Logistics	WX	NSWC PC	0.416			1.140	NOV-08	0.806	NOV-09		2.362	0.000
Subtotal US3 Support			**2.787**			**5.667**		**3.365**			**11.819**	**0.000**
Remarks:												
Test and Evaluation	TBD	ITT	0.627			0.559	NOV-08	1.417	DEC-09		2.603	0.000
Test and Evaluation	WX	NSWC PC	0.436			0.839	NOV-08	2.339	NOV-09		3.614	0.000
Subtotal US3 Test and Evaluation			**1.063**			**1.398**		**3.756**			**6.217**	**0.000**
Remarks:												
Contractor Management	TBD	ITT	0.323			0.466	NOV-08	0.310	DEC-09		1.099	0.000
Government Management Support	Var	Various	1.178			0.752	NOV-08	0.750	NOV-09		2.680	0.000
Travel	PD	NAVSEA	0.050			0.025	NOV-08	0.025	NOV-09		0.100	0.000
Subtotal US3 Management			**1.551**			**1.243**		**1.085**			**3.879**	**0.000**
Remarks:												

CLASSIFICATION:	UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**					
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
Total Cost			**66.884**			**25.155**		**21.469**			**113.508**	**0.000**

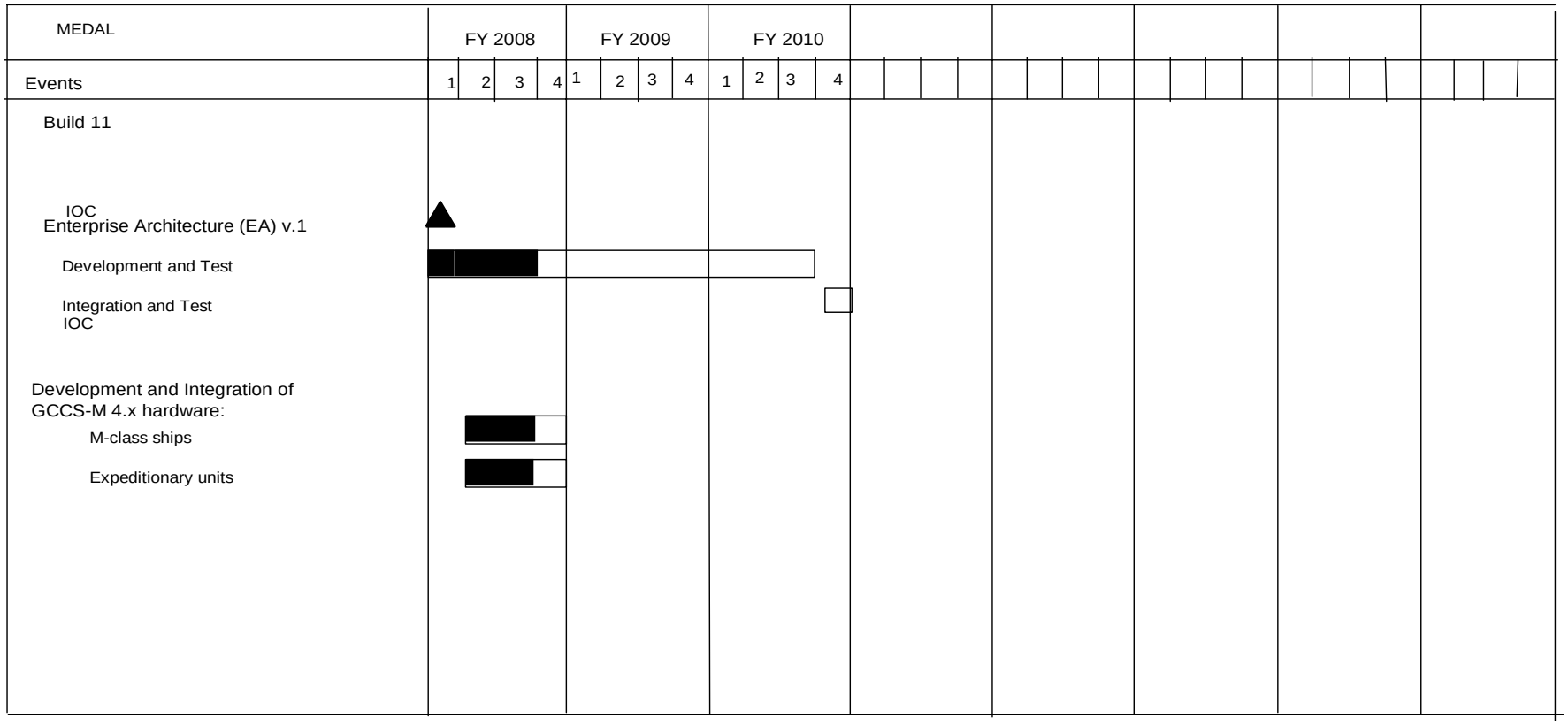
CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **1233b/MCM CES**



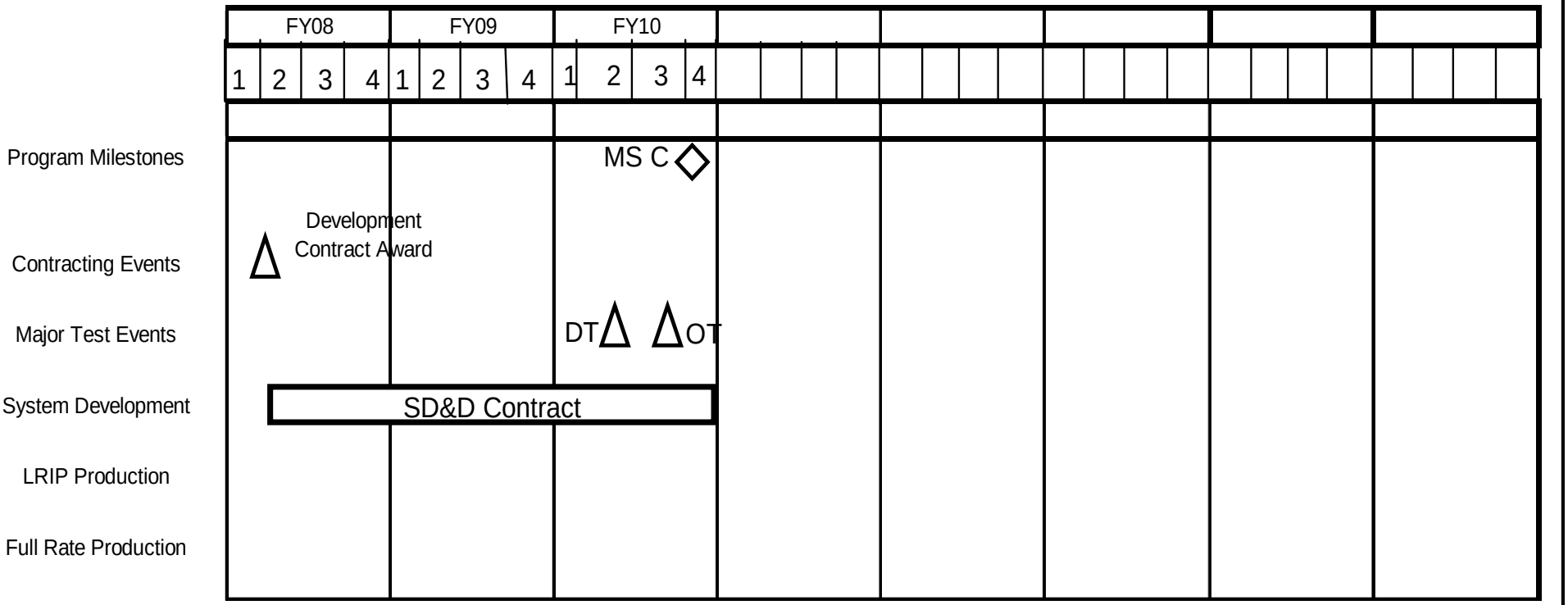
CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **1233c/HFWB Sonar Upgrade**



CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUN**	PROJECT NUMBER AND NAME **1233d/MEDAL**



CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **1233e/US3**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERME**			PROJECT NUMBER AND NAME **1233/Surface MCM Mid-life Upgrade**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
MCM CES: Build 0 IOC	1Q						
MCM CES: Build 1 Development and Test	1Q-4Q	1Q-4Q					
MCM CES: Build 1 Integration and Test			3Q-4Q				
HFWB: Design	1Q-2Q						
HFWB: Milestone C/FRPD			1Q				
HFWB: Subsystem Integration	1Q-4Q	1Q-2Q					
HFWB: At-SEA Test		3Q-4Q					
HFWB: EQT Testing		4Q					
HFWB: Contract Award			2Q				
HFWB: Full Rate Production			2Q-4Q				
HFWB: P3I Development			1Q-4Q				
MEDAL: Build 11 IOC	1Q						
MEDAL: Enterprise Arch (EA) v.1 Development and Test	1Q-4Q	1Q-4Q	1Q-3Q				
MEDAL: EA v.1 Integration and Test			4Q				
MEDAL: Dev. & Integration of GCCS hardware: MCM Class	2Q-4Q						
MEDAL: Dev. & Integration of GCCS hardware: Expeditionary Units	2Q-4Q						
US3: Milestone C			4Q				
US3: Development Contract Award	1Q-2Q						
US3: DT Testing			2Q				
US3: OT Testing			3Q				
US3: SD&D Contract	2Q-4Q	1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **2094/Unmanned Underwater Vehicle**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	12.637	27.053	0.000				
RDT&E Articles Qty	0	0	0		0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The November 2004 UUV Master Plan established Intelligence, Surveillance, and Reconnaissance (ISR), and clandestine Mine Countermeasures (MCM) as top priorities. The Mission Reconfigurable Unmanned Undersea Vehicle System (MRUUVS) will provide these capabilities to the warfighter. The MRUUVS Capability Development Document (CDD) was approved by the Joint Requirements Oversight Council (JROC) in June 2007.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	PROJECT NUMBER AND NAME **2094/Unmanned Underwater Vehicle**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	12.637	27.053	0.000
RDT&E Articles Quantity	0	0	0

21" MRUUVS - FY08 - Completed the LMRS Launch and Recovery risk reduction demonstration. Initiate limited Phase I development which will integrate Littoral Precision Underwater Mapping Array (LPUMA) onto two existing LMRS EDM vehicles. Develop the request for proposal with a development contract award planned in the last quarter of FY08.

FY09 - Continue integration of LPUMA with in-water testing and a SSN demonstration of limited Phase I systems completing the effort in FY10.

C. OTHER PROGRAM FUNDING SUMMARY:

N/A

D. ACQUISITION STRATEGY:

In FY09, complete the integration of LPUMA into LMRS EDM vehicles and complete integration testing. In early FY10 complete a SSN demonstration at Navy ranges. Prepare for safety certification for installation on-board an attack submarine, and install system on attack submarine for at-sea demonstration of LPUMA mine detection, obstacle avoidance, UUV recovery on board attack submarine, and real-time merging of LPUMA data with submarine High Frequency sensor database for complete battlespace preparation.

E. MAJOR PERFORMERS:

Major performers are Boeing and Various other Government activities and contractors.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **2131/Assault Breaching System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	25.653	43.886	30.871				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program provides for a combination of U.S. Navy projects planned to counter the threat to amphibious landing forces from known and projected foreign land/sea mines, obstacles in the beach zone and surf zone approaches to amphibious assault areas. The Assault Breaching System (ABS) of Systems (Countermine/Counter Obstacle, Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T), Precision Navigation/Virtual Marking/Integration, C4I/Data Fusion) provides a full assault breaching capability which is an essential element to the Ship To Objective Maneuver (STOM) Concept of Operations.

Countermine/Counter Obstacle (CM/CO) -

Far term - Counter Mine System (CMS) - transitioned from a 6.3 S&T Concept Demonstration effort to a 6.4 development program after a concept decision/AoA in FY06.

ISR/T - Coastal Battlefield Reconnaissance and Analysis (COBRA) is the ISR/T part of the ABS of systems. One system consists of two Airborne Payloads and one Post Mission Analysis Station. Under the umbrella of evolutionary acquisition, three increments of development are planned; Block I introduces a daytime, surface laid minefield and obstacle detection capability for the Beach Zone. Blocks II and III will incorporate technology being developed by 6.3.

S&T. Block II adds a surfzone and night (darkness) detection capability. Block III adds a buried mine detection capability and on-board Near-Real-Time processing of Multi Spectral Imagery data.

COBRA will be a modular payload architecture of and integrated with the MQ-8B Fire Scout Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV) and will serve as the "detect" mission module of the Littoral Combat Ship (LCS) Mine Warfare mission package.

Precision Navigation/Virtual Marking- The navigation effort involves requirements development and program planning to choose the navigational upgrades for the Landing Craft, Air Cushion (LCAC) and Landing Craft, Utility (LCU), and Amphibious Assault Vehicle (AAV) to enable the craft to safely navigate the neutralized assault lanes. A system of virtual or physical lane marking is to be developed to guide the assault craft through the neutralized assault lanes. OPN will fund the CRAFTALTS to upgrade the navigation systems.

LCU Navigation Upgrade: Modernized the navigation system to enable safe transit through the breached lane.

LCAC Autopilot Upgrade: An integrated improvement to the LCAC (Service Life Extension Program (SLEP) navigation system for craft control that allows precise navigation and hovering within the breached lane. These software upgrades and backfits will occur during scheduled LCAC SLEPs.

AAV Navigation Upgrade : Modernized the navigation system to enable precise transit through the breached lane.

Command, Control, Computers, Communications and Intelligence (C4I) - System will tie all of the above systems together under an integrated ABS architecture and also tie in with the integrated Mine Warfare architecture.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**2131/Assault Breaching System**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	20.406	37.110	24.437
RDT&E Articles Quantity	0	0	0

Product Development:

FY 08: Countermine System Contract Awards; Conduct Contract Kick-off Meetings, System Readiness Reviews, and approve Preliminary Designs for CMS; and procure long-lead time material for AAV Upgrades.

FY 09: Exercising contract options for CMS and awarding COBRA Block II contract and conducting system technical reviews on COBRA Block II and CMS.

FY 10: CMS Critical Design Review (CDR); Conduct COBRA Block II Preliminary Design Review (PDR).

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.583	0.999	0.961
RDT&E Articles Quantity	0	0	0

Support:

FY 08: Precision Navigation/Virtual Marking - COTS technical analysis, product integration, market surveys, technical support in installation instructions.

FY 09: ISR/T - Technical analysis, modeling and simulation.

FY 10: Conduct Weapon System Explosive Safety Requirements Board (WSESRB) Review; evaluate Flight Certification for Non-Navy Aircraft.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.165	0.206	0.167
RDT&E Articles Quantity	0	0	0

Test and Evaluation:

FY 08:CMS dart testing. Precision Navigation/Virtual Marking - Vehicle/crew compatibility testing, Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T) - COBRA Block I Operational Assessment, Block II and III OPEVAL.

FY 09: Complete Breaching System Effectiveness Simulation and ABS Effectiveness Tool.

FY 10: Complete Integrated Test Phase I and II associated with Neutralizer and Sled Tests.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.499	5.571	5.306

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**2131/Assault Breaching System**	
RDT&E Articles Quantity	0	0	0

Management:

FY 08: Analysis of Material approvals and Functional needs analysis/functional solutions analysis.

FY 09 - FY 10: Mine magazine inventory management and shipping, contract management and tests/studies, C4I/Data fusion.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
OPN 2624	1.437	7.333	7.835	16.605
OPN 1600	0.000	73.684	137.259	210.943
WPN 4221	0.000	2.778	0.000	2.778

D. ACQUISITION STRATEGY:

Countermine/Counter Obstacle (CM/CO) is a two phased approach, near term and far term solutions. The near term approach for CMCO is JDAM Assault Breaching System (JABS) and this effort has been completed. The far term solution is CMS, which transitioned from ONR in 2nd QTR 07 followed by MS B decision in 3rd QTR 07 and SD&D contract in 3rd QTR 08.

Intelligence/Surveillance/Reconnaissance/Targeting (ISR/T) - COBRA Block I will achieved MS C in 3rd QTR FY08, COBRA Block II technology will transfer from ONR and achieve MS B between 2nd/3rd QTR FY09.

Precision Navigation/Virtual Marking- The navigation upgrades for the Landing Craft, Air Cushion (LCAC) and Landing Craft, Utility (LCU) are in progress. AAV enhancements will be achieved through an ECP (PMA AAV (Marine Corps)) in 2 QTR 08.

E. MAJOR PERFORMERS:

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **2131/Assault Breaching System**						
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
Primary Hardware Dev, COBRA	WX	Northup Grumman	95.411			7.959	FEB-09	6.893	FEB-10		110.263	0.000
Primary Hardware Dev, CMS	WX	Unknown	16.555			15.980	FEB-09	5.041	FEB-10		37.576	0.000
Ancillary Hardware Dev, JABS	WX	Unknown	9.222			0.000		0.000			9.222	0.000
Systems Engineering, COBRA	WX	NSWC PC	7.378			5.082	NOV-08	4.823	NOV-09		17.283	0.000
Software Dev, COBRA	WX	NAVAIR	6.128			3.518	NOV-08	3.340	NOV-09		12.986	0.000
Systems Engineering, CMS	WX	NSWC IH	20.148			1.921	NOV-08	1.824	NOV-09		23.893	0.000
Training Dev, COBRA	WX	NSWC IH	3.475			0.893	NOV-08	0.848	NOV-09		5.216	0.000
Tooling	WX	NSWC IH	0.860			0.000		0.000			0.860	0.000
ABS IPT/Test Assets/Proj Eng	WX	NSWC IH	5.737			0.380	NOV-08	0.361	NOV-09		6.478	0.000
Precision Navigation & Marking	WX	NSWC IH	1.108			1.377	NOV-08	1.307	NOV-09		3.792	0.000
Subtotal Product Development			**166.022**			**37.110**		**24.437**			**227.569**	**0.000**

Remarks:

Note 1:Hardware contracts (COBRA, CMS, and JABS) will be processed through NSWC Panama City.

Note 2: Prior Year Cost include both US Marine Corp and US Navy funds.

Note 3: FY 08 RDT&E Costs are associated with completing COBRA Block I system testing and initiating COBRA Block II contract efforts.

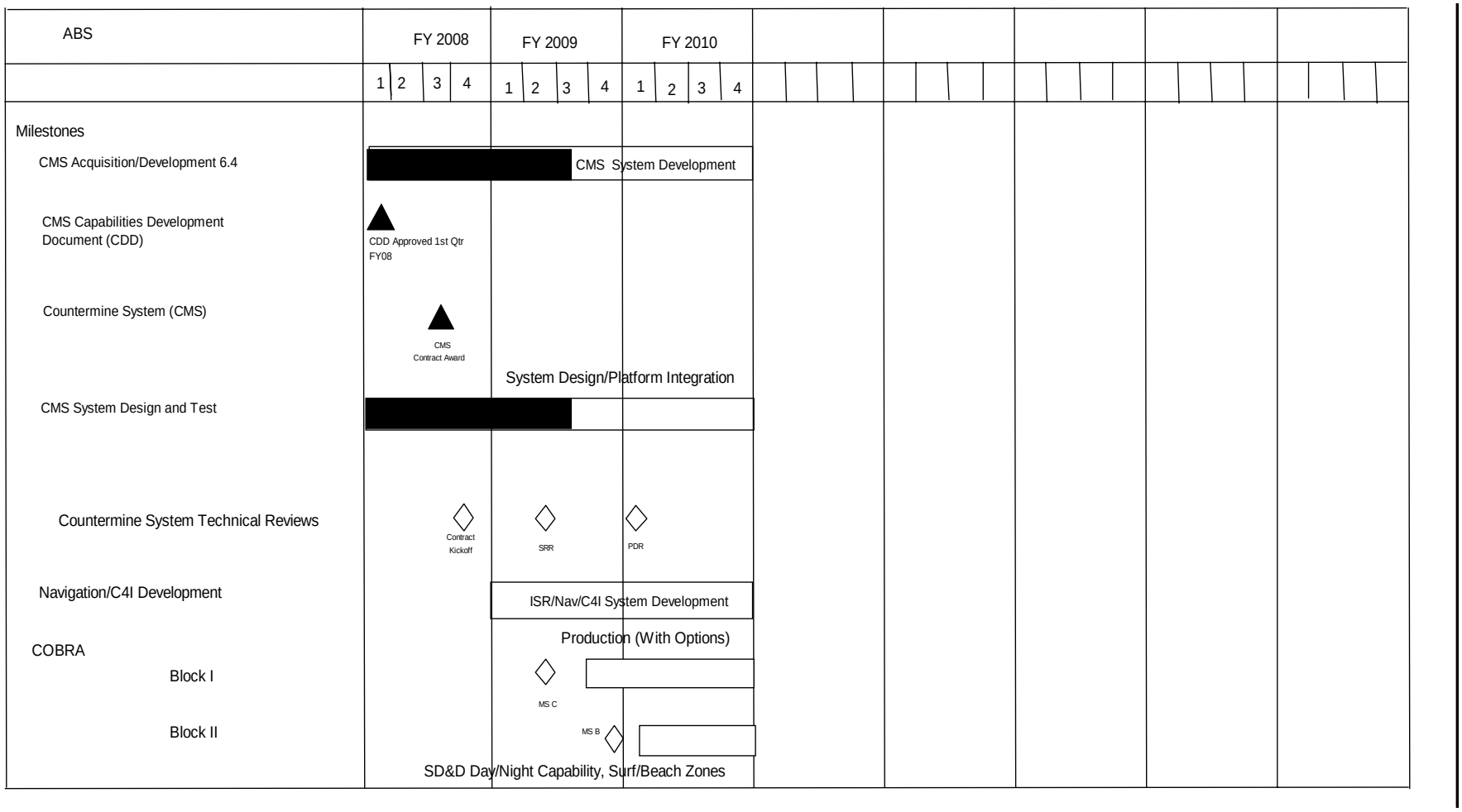
Note 4: FY 09 RDT&E cost estimates are related to exercising COBRA Block II and CMS contract options.

Development Support Equipment	WX	NSWC PC	13.406			0.793	NOV-08	0.753	NOV-09		14.952	0.000
Software Development	WX	NSWC PC	8.037			0.000		0.000			8.037	0.000
Integrated Logistics Support	WX	NSWC IH	2.712			0.000		0.000			2.712	0.000
Configuration Management	WX	NSWC PC	3.744			0.000		0.000			3.744	0.000
Technical Data	WX	NSWC PC	2.588			0.000		0.000			2.588	0.000
Studies & Analysis	WX	NSWC PC	4.374			0.206	NOV-08	0.208	NOV-09		4.788	0.000
GFE	WX	NSWC PC	0.400			0.000		0.000			0.400	0.000
Subtotal Support Costs			**35.261**			**0.999**		**0.961**			**37.221**	**0.000**

Remarks:

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **2131/Assault Breaching System**						
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
Development Test & Evaluation	WX	NSWC IH	29.953			0.206	NOV-08	0.167	NOV-09		30.326	0.000
Operational Test & Evaluation	WX	NSWC IH, PC	8.655			0.000		0.000			8.655	0.000
Tooling	WX	NSWC IH, PC	0.700			0.000		0.000			0.700	0.000
GFE	WX	NSWC IH, PC	0.400			0.000		0.000			0.400	0.000
			0.000			0.000		0.000			0.000	0.000
Subtotal Test and Evaluation			**39.708**			**0.206**		**0.167**		**0.000**	**40.081**	**0.000**
Remarks:												
Contractor Engineering Support	CPFF	CACI, Norhtrup Grumman	6.246			1.075	NOV-08	1.122	NOV-09		8.443	0.000
Government Engineering Support	WX	NSWC IH	25.995			2.206	NOV-08	2.094	NOV-09		30.295	0.000
Program Management Support	WX	NSWC IH, PC	17.703			2.201	NOV-08	2.090	NOV-09		21.994	0.000
Travel	PD	NAVSEA	1.124			0.089	NOV-08	0.000			1.213	0.000
Assessment/BTR	Various	Various	1.434			0.000		0.000			1.434	0.000
Subtotal Management Services			**52.502**			**5.571**		**5.306**			**63.379**	**0.000**
Remarks:												
Total Cost			**293.493**			**43.886**		**30.871**			**368.250**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **2131/Assault Breaching System**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERME**			PROJECT NUMBER AND NAME **2131/Assault Breaching System**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
COBRA Block I Milestone MS C		2Q					
COBRA Block I Procurement		3Q-4Q	1Q-4Q				
COBRA Block II SD&D			1Q-4Q				
COBRA Block II Milestone B		4Q					
CMS System Development	1Q-4Q	1Q-4Q	1Q-4Q				
CMS Contract Award	3Q						
SRR - System Requirements Review		2Q					
PDR - Preliminary Design Review			1Q				
ISR/NAV/C4I Development		1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **3123/SMCM UUV**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	7.518	12.610	15.610				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) provides for development of Unmanned Underwater Vehicles to support dedicated mine countermeasure operations, including buried mine detection. Equipment includes vehicles and associated systems support equipment. Potential P3I candidates include communications upgrades, on-board sonar processing and target recognition, command and control improvements, and other smaller tasks.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**3123/SMCM UUV**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	7.518	12.610	15.610
RDT&E Articles Quantity	0	0	0

SMCM UUV - FY08 - Demonstrate operation of a UUV-based capability package for standoff, multiple MCM operations, including buried mine detection, from Littoral Combat Ship (LCS) and craft of opportunity. Continue program management, contract management, logistic support, systems engineering, T&E planning and oversight, ship integration, information assurance, safety, software, and sonarconsultation and operations support. Low Frequency Broadband (LFBB) design and prototyping of critical technology components for demonstration and evaluation.

FY09 - Milestone B and development contract award. LFBB development continues in FY09.

FY10 - Preliminary Design Review, Critical Design Review preparatioin, begin fabrication of Engineering Development Model.

C. OTHER PROGRAM FUNDING SUMMARY:

N/A

D. ACQUISITION STRATEGY:

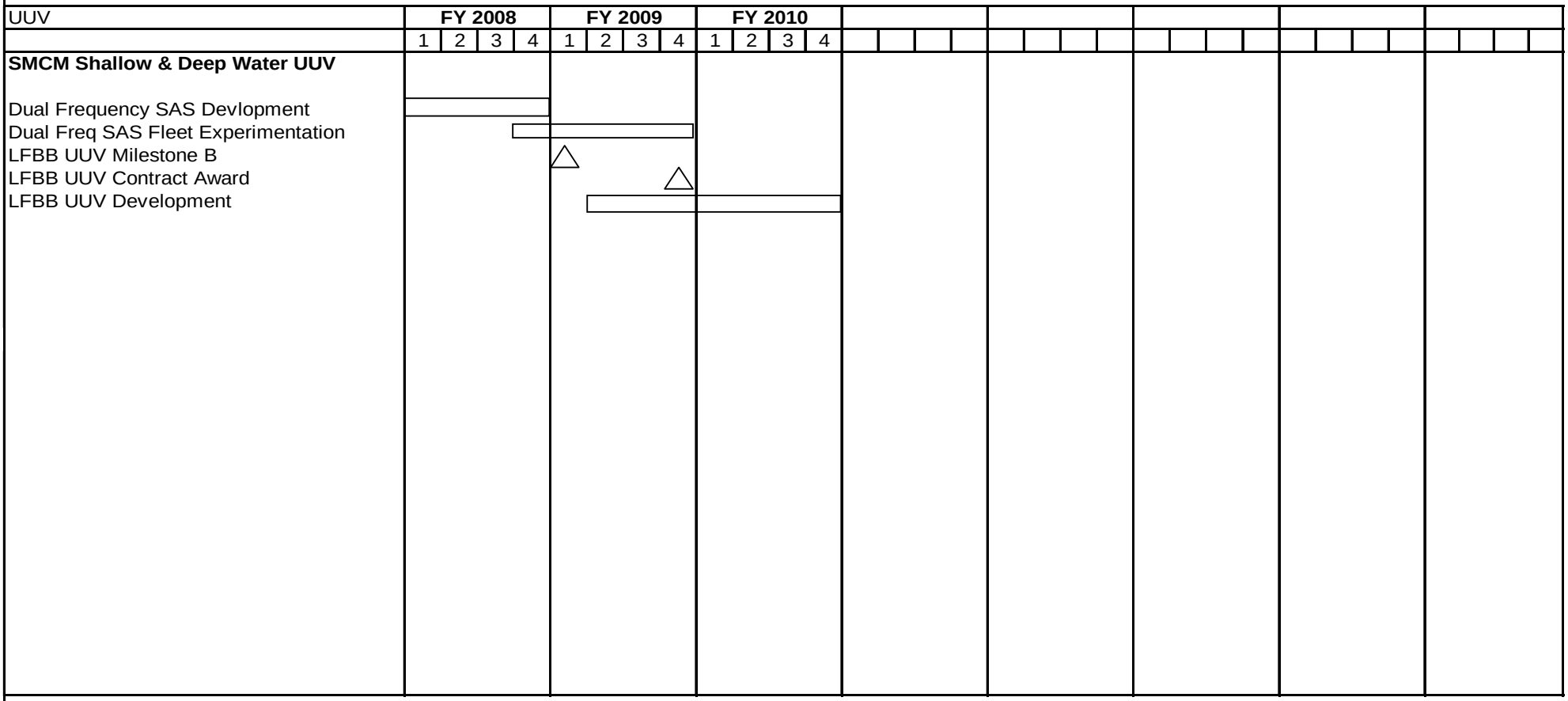
An acquisition program will be initiated in FY09 to develop Surface Mine Countermeasure Unmanned Undersea Vehicles (SMCM UUV) equipped with Low Frequency Broadband (LFBB) sonar that provides buried mine detection capability.

E. MAJOR PERFORMERS:

Major performers are NSWC Panama City, NUWC Newport, NAVO and various contractors.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **3123/SMCM UUV**						
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
SMCM UOES Devevlopment	CPAF	Bluefin, Cambridge, MA	12.544			1.100	DEC-08	0.600	DEC-09		CONT	0.000
SMCM UUV Development	TBD	TBD	2.765			9.729	SEP-09	10.234	DEC-09		CONT	0.000
Software Development	WX	NSWC, Panama City, FL	0.805			0.000		0.000			0.805	0.000
Subtotal Product Development			**16.114**			**10.829**		**10.834**			**CONT**	**0.000**
Remarks:												
Engineering Support	WX	NSWC, Panama City, FL	5.223			0.788	DEC-08	2.612	DEC-09		CONT	0.000
Engineering Support	WX	NUWC, Newport, RI	1.487			0.269	DEC-08	0.839	DEC-09		CONT	0.000
Engineering Support	WX	Various	0.030			0.165	DEC-08	0.700	DEC-09		CONT	0.000
Subtotal Support Costs			**6.740**			**1.222**		**4.151**			**CONT**	**0.000**
Remarks:												
Developmental Test & Evaluation	WX	NOMWC, Stennis	0.236			0.065	DEC-08	0.066			CONT	0.000
Government T&E Support		Various	0.579			0.189	DEC-08	0.192			CONT	0.000
Test and Evaluation	WX	COMOPTEVFOR	0.085			0.000		0.056	DEC-09		0.141	0.000
Subtotal Test and Evaluation			**0.900**			**0.254**		**0.314**			**CONT**	**0.000**
Remarks:												
Program Management Support	CPFF	Various, Wash., DC	0.400			0.255	DEC-08	0.261	DEC-09		0.916	0.000
Travel			0.050			0.050	NOV-08	0.050	NOV-09		0.150	0.000
Subtotal Management Services			**0.450**			**0.305**		**0.311**			**1.066**	**0.000**
Remarks:												
Total Cost			**24.204**			**12.610**		**15.610**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **3123/SMCM UUV**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERME**			PROJECT NUMBER AND NAME **3123/SMCM UUV**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Dual Frequency SAS Development	1Q-4Q						
Dual Frequency SAS Fleet Experimentation	4Q	1Q-4Q					
LFBB UUV Milestone B		1Q					
LFBB UUV Contract Award		4Q					
LFBB UUV/LFBB Development		2Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEA**				PROJECT NUMBER AND NAME **4025/Expendable Mine Neutralization System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	6.654	7.139	2.858				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Expendable Mine Neutralization System (EMNS) is a replacement to the existing AN/SLQ-48 Mine Neutralization System (MNS). The current program replaces the MNS with EMNS on the 14 MCM Avenger Class Ships. EMNS will leverage off of on-going efforts in the Airborne Mine Countermeasures Program to develop an Airborne Mine Neutralization System (AMNS).

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**4025/Expendable Mine Neutralization System**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.444	1.110	0.407
RDT&E Articles Quantity	0	0	0

Award Development Contract for Expendable Mine Neutralization System (EMNS) integrator. Initiate hardware design and development to include launcher, control console, and MCM-1 Class ship integration. Modify software for use on an MCM-1 class ship. Integrate EMNS Engineering Development Model (EDM) aboard MCM-1 Class Ship. Award contract for Common Neutralizer support. Provide test articles and technical support throughout EMNS development.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	5.008	3.103	1.188
RDT&E Articles Quantity	0	0	0

Develop logistics products, including training materials and interactive technical manual. Provide Engineering support, including review for product development and ship integration.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	2.768	0.896
RDT&E Articles Quantity	0	0	0

EMNS developmental testing including environmental and shock testing, safety testing, and contractor testing. Develop Test and Evaluation Master Plan (TEMP) and test reports. Conduct DT/OT.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.202	0.158	0.367
RDT&E Articles Quantity	0	0	0

Provide program management support and travel for EMNS.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
OPN 2622:EMNS	0.000	7.218	6.300	13.518
WPN 4225: EMNS	0.000	0.000	7.870	7.870

D. ACQUISITION STRATEGY:

Based on the approved Common Neutralizer Strategy, the Archerfish neutralizer will be integrated on the MCM-1 Avenger Class Ships. The acquisition strategy will be full and

open competition for non-neutralizer hardware development and system integration with a directed contractual relationship with VCT (flight control software). The Navy awarded a sole source contract to BAE Systems for Common Neutralizer support, integration, and hardware manufacturing/delivery. All EMNS neutralizer equipment and support will be provided by BAE Systems to the Navy. The Navy will provide these assets as GFE to the integration contractor.

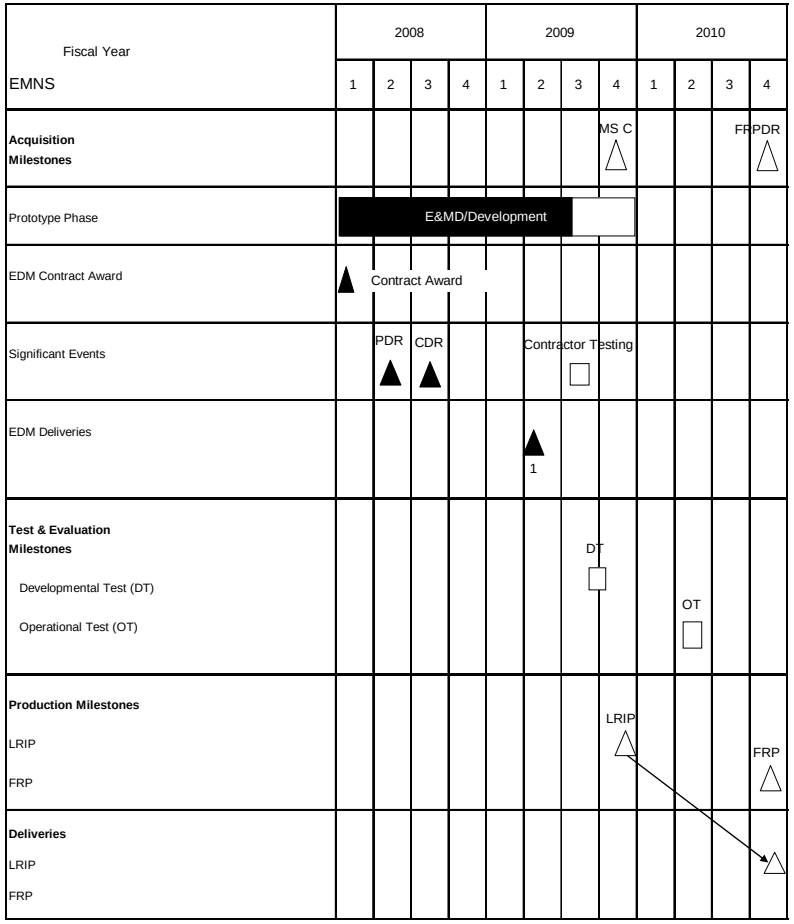
E. MAJOR PERFORMERS:

Major performers are various contractors.

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**				PROJECT NUMBER AND NAME **4025/Expendable Mine Neutralization System**						
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
Develop Technical and Acquisition Documentation	WX	NSWC PC	1.203			0.446	NOV-08	0.407	NOV-09		2.056	0.000
Hardware/Software Delevopment	CPIF	Lockheed Martin, Syr NY	9.521			0.664	NOV-08	0.000	NOV-09		10.185	0.000
Common Neutralizer Development	C/CPIF	Raytheon, Portsmouth RI	2.431			0.000		0.000			2.431	0.000
Deep Water Neutralizer Development	WX	NSWC PC	0.000			0.000		0.000			0.300	0.000
Deep Water Neutralizer Development	CPIF	BAE Systems	0.000			0.000		0.000			3.000	0.000
Subtotal Product Development			**13.155**			**1.110**		**0.407**			**17.972**	**0.000**
Remarks:												
Develop Logistics Products	CPIF	Lockheed Martin, Syr NY	1.991			0.650	OCT-08	0.000			2.641	0.000
Develop Logistics Products	WX	NSWC	0.616			0.350	OCT-08	0.000			0.966	0.000
Engineering Support	CPIF	Lockheed Martin, Syr NY	1.557			0.887	OCT-08	0.230	NOV-09		2.674	0.000
Engineering Support	WX	NSWC	5.282			1.216	OCT-08	0.958	NOV-09		7.456	0.000
Deep Water Neutralizer ILS	CPIF	BAE Systemsd	0.000			0.000		0.000			0.252	0.000
Deep Water Neutralizer ILS	WX	NSWC PC	0.000			0.000		0.000			0.186	0.000
Deep Water Neutralizer Engineering	CPIF	BAE Systems	0.000			0.000		0.000			2.200	0.000
Deep Water Neutralizer Engineering	WX	NSWC PC	0.000			0.000		0.000			0.860	0.000
Subtotal Support Costs			**9.446**			**3.103**		**1.188**			**17.235**	**0.000**
Remarks:												
Develop TEMP	WX	NSWC PC	0.100			0.000		0.000			0.100	0.000
CT/DT	CPIF	Lockheed Martin, Syr NY	0.000			1.384	OCT-08	0.000			1.384	0.000
CT/DT	WX	NSWC PC	0.000			1.384	OCT-08	0.000			1.384	0.000
Operational Test & Evaluation	WX	COTF Norfolk, VA	0.000			0.000		0.896	OCT-09		0.896	0.000
Common Neutralizer Testing	CPIF	Raytheon, Portsmouth RI	0.000			0.000		0.000			0.000	0.000
Common Neutralizer Test Sets	CPIF	Raytheon, Portsmouth RI	0.000			0.000		0.000			0.000	0.000
Deep Water Neutralizer T&E	CPIF	BAE Systems	0.000			0.000		0.000			0.995	0.000
Deep Water Neutralizer T&E	WX	NSWC PC	0.000			0.000		0.000			2.295	0.000
			0.000			0.000		0.000			0.000	0.000
Subtotal Test and Evaluation			**0.100**			**2.768**		**0.896**			**7.054**	**0.000**

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERMEASU**					PROJECT NUMBER AND NAME **4025/Expendable Mine Neutralization System**					
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:												
Program Management Support	CPFF	CACI	0.871			0.096	OCT-08	0.327	OCT-09		1.294	0.000
Travel	PD	NAVSEA	0.170			0.062	OCT-08	0.040	OCT-09		0.272	0.000
Subtotal Management Services			**1.041**			**0.158**		**0.367**			**1.566**	**0.000**
Remarks:												
Total Cost			**23.742**			**7.139**		**2.858**			**43.827**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNT**	PROJECT NUMBER AND NAME **4025/Expendable Mine Neutralization System**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603502N/SURFACE AND SHALLOW WATER MINE COUNTERME**			PROJECT NUMBER AND NAME **4025/Expendable Mine Neutralization System**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Contract Award	1Q						
Integration Development	1Q-4Q	1Q-4Q					
Preliminary Design Review	2Q						
Critical Design Review	3Q						
EDM Deliveries		2Q					
Contractor Testing (CT)		3Q					
Milestone C		4Q					
LRIP Start		4Q					
Development Testing (DT)		3Q					
Operational Testing (OT)			2Q				
FDR/PDR			4Q				
FRP Start			4Q				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603502N/SURFACE AND SHALLOW WATER MINE COUNTER**	**9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9967A/AN/SQQ-32 Mine Hunting Sonar Upgrade	0.000	3.191	0.000
RDT&E Articles Quantity	0	0	0

Congressional Add to upgrade AN/SQQ-32(V)3 Classification Sonar, and to provide detection transducer development, design and quality sonar operator equipment consoles applicable to High Frequency Wide Band.

	FY 2008	FY 2009	FY 2010
9179A / Unmannned Undersea Vehicles Near Term Interim Capability	0.000	3.988	0.000
RDT&E Articles Quantity	0	0	0

Congressional Add to develop interim UUV capability, with common and modular architecture, to the Submarine Force and Surface Fleet that would allow for the development of CONOPS, and Training Tactics.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603506N/SURFACE SHIP TORPEDO DEFENSE**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	32.668	51.545	57.538				
0225 / Surface Ship Torpedo Defense (SSTD)	22.641	48.992	57.538				
9999 / CONGRESSIONAL ADDS	10.027	2.553	0.000				

A. MISSION DESCRIPTION:

Project 0225 utilizes previous development of components of the AN/WSQ-11 Torpedo Defense System and applies them to a detect to engage hardkill torpedo defense system now called the Anti-Torpedo Torpedo Defense System (ATTDS) as specified in the Capability Development Document (CDD). This acquisition program espouses an evolutionary acquisition strategy of providing incremental surface ship torpedo defense capability to the fleet by implementing first on ships already equipped with sonar systems, fire control systems and launchers. Results of FY06 through FY08 at-sea demonstrations of Torpedo Detection Classification & Localization (TDCL) systems lead to a CRUDES TDCL system specification development in FY09. At sea testing of the EDM-1 design of the Anti-Torpedo Torpedo (ATT) variant of the Common Very Lightweight Torpedo (CVLWT) in FY07 and FY08 will facilitate design of the EDM-2 ATT which will be completed in FY10. Also in FY 09, an EDM of the ship components for CRUDES application will be developed. This EDM will legerage existing program of record systems on CRUDES to provide the TDCL system, a command and control system with user interface, a modified Surface Vessel Torpedo Tube launcher, and a canistered Anti-Torpedo Torpedo. The TDCL system will utilize a sensor set added to the AN/SLQ-25A (NIXIE) System, processing in the SQQ-89, as well as the hull mounted sonar already employed on these ships. The development of the ATT is the first derivative of the CVLWT as a funded acquisition program. An offensive warhead design is being investigated separately by ONR that will allow for a variant of the CVLWT to accommodate multi-mission (offensive & defensive) applications. The ATT as well as the TDCL development are closely linked with the ONR FNC programs (Sea Shield FNC's) which provide advance technology inserts at key transition points in support of the planned ATTDS, and TDCL schedules.

(U) Project 9B54A - FY08 Congressional Add: Accelerates development of the Anti-Torpedo Torpedo EDM-2 design effort and conducts additional in-water test events on ATT EDM-1 units.

(U) Project 9B55A - FY08 Congressional Add: Apply industry cost affordability manufacturability practices (DFA/DFM) to the ATT system design similar to previous successful efforts to reduce ATT subsystem component manufacturing costs.

(U) Project 9D21A - FY09 Congressional Add: Develop the Open Architecture (OA) supportability processes, methods, and tools required to facilitate the real-time capture and cataloging of sailor training, performance, and vocational skills data.

(U) Project 9D22A - FY09 Congressional Add: Expand technology development of mobile countermeasures used for Surface Ship Torpedo Defense including device engineering, fabrication and testing capabilities to assess the effectiveness of Next Generation (mobile) Countermeasures.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603506N/SURFACE SHIP TORPEDO DEFENSE**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	27.451	49.171	24.739
FY10 President's Budget	32.668	51.545	57.538
Total Adjustments	5.217	2.374	32.799
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	-1.490	2.420	0.000
SBIR/STTR/FTT Assessment	-0.438	0.000	0.000
Program Adjustments	7.145	0.000	33.644
Rate/Misc Adjustments	0.000	-0.046	-0.845
Total	5.217	2.374	32.799

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010
OPN 2213			
Surface Ship Torpedo Defense - SSTD	9.950	19.600	2.184
WPN 3113			
Surface Ship Torpedo Defense - SSTD	0.013	0.000	0.000

D. ACQUISITION STRATEGY:

The project develops Surface Ship Torpedo Defense (SSTD) capabilities using an evolutionary acquisition incremental development approach. OPN: In FY08 - FY09, the OPN funding upgrades the existing AN/SLQ-25A NIXIE through ECP's performed by the Original Equipment Manufacture (OEM) and includes procurement and installation. The FY09 MS B approves the ATTDS as a system of systems to bring a hard kill torpedo defense system to surface ships. The previous EDM-1 Common Very Lightweight Torpedo (CVLWT) design brings in the hard-kill component of the ATTDS. The EDM-2 design started in FY08 and continuing through FY09 and into FY10. FY10 will develop the dedicated Anti-Torpedo Torpedo variant of the the CVLWT. EDM-2 units to support the System Development and Demonstration phase of the program will be built by ARL/PSU. The offensive capability of the CVLWT either as common vehicle that accommodates both offensive and defensive missions or as a dedicated offensive vehicle may be acquired in a future acquisition cycle. Development of offensive capabilities are conducted by ARL/PSU and funded separately by ONR.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**				PROJECT NUMBER AND NAME **0225/Surface Ship Torpedo Defense (SSTD)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	22.641	48.992	57.538				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project 0225 utilizes previous development of components of the AN/WSQ-11 Torpedo Defense System and applies them to a Cruiser and Destroyer (CRUDES) based Torpedo Defense System. This development approach espouses an Evolutionary Acquisition strategy of providing incremental surface ship torpedo defense capability to the fleet by implementing first on ships already equipped with sonar systems, fire control systems and launchers. Subsequent increments will install this capability on large deck ships such as Amphibs, Carriers, and Combat Logistic Force (CLF) ships.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**	PROJECT NUMBER AND NAME **0225/Surface Ship Torpedo Defense (SSTD)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	15.496	39.992	41.538
RDT&E Articles Quantity	0	0	0

ANTI-TORPEDO TORPEDO (ATT)

FY08- Initiate ATT EDM-2 design. Conduct warhead testing CT1-4 in-water trials. Continue ATT Launcher development.
FY09- Continue ATT EDM-2 Design. Complete ATT Launcher development. Conduct DDG Demonstration. Complete CDD. Achieve MS B.
FY10- Continue ATT EDM Build. Perform Critical Design Review (CDR).

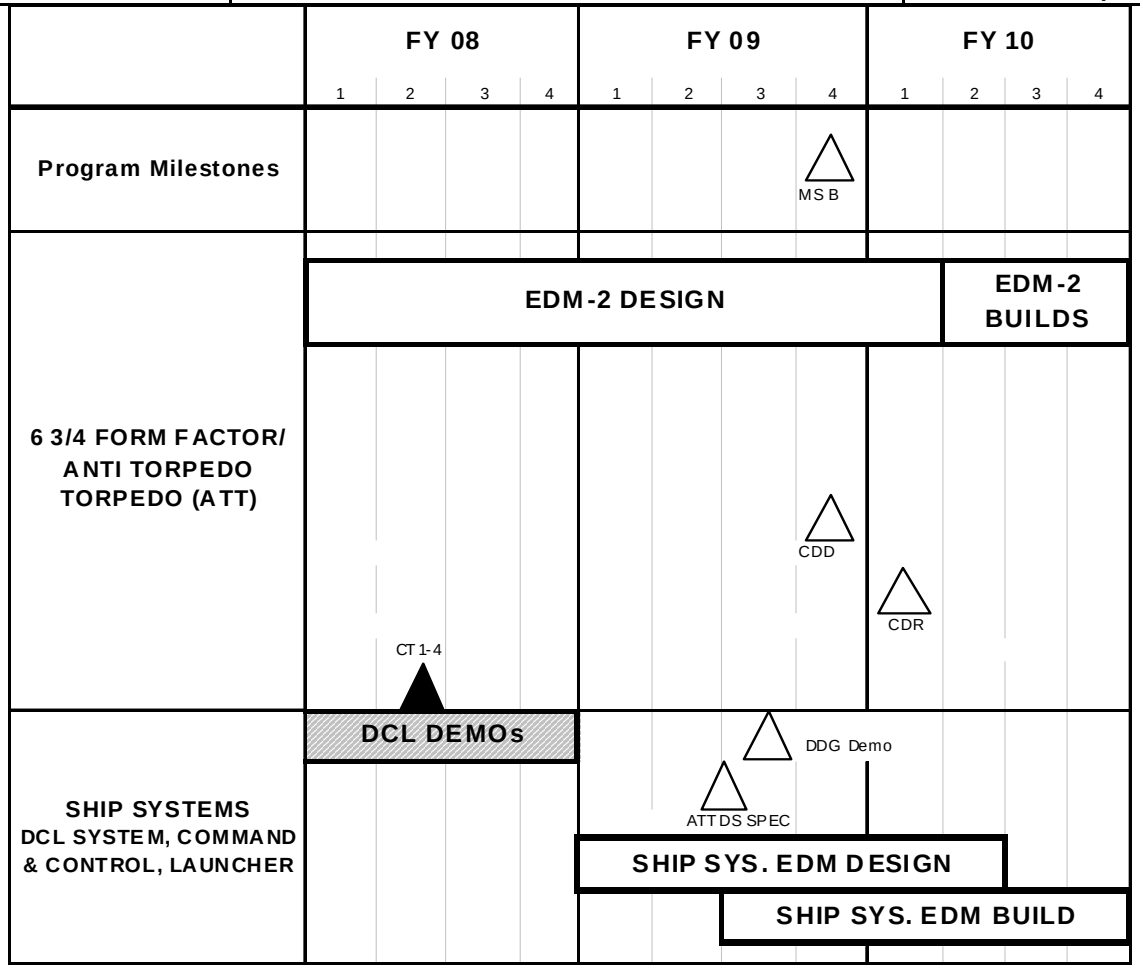
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	7.145	9.000	16.000
RDT&E Articles Quantity	0	0	0

SHIP SYSTEMS

FY08 - Initiate TDCL Performance Spec. Conduct ATT EDM-1 in-water test event.
FY09 - Initiate Ship System EDM Design. Conduct DDG-51 TDCL Test Event. Generate ATTDS Spec. Initiate Ship System EDM Build.
FY10 - Complete Ship Systems EDM design. Continue Ship System EDM Build. Conduct Critical Design Review (CDR).

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**			PROJECT NUMBER AND NAME **0225/Surface Ship Torpedo Defense (SSTD)**					
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			
Systems Engineering	WR	NUWC, Newport, RI	10.440	7.449	DEC-08	8.400	DEC-09			
Systems Engineering ATT Dev.	CPFF	PSU/ARL, State College, PA	50.270	25.701	FEB-09	29.113	FEB-10			
Systems Engineering	CPFF	JHU/APL, Baltimore , MD	1.020	0.250	NOV-08	0.300	FEB-10			
Systems Engineering Warhead Dev.	WR	NSWC, Indian Head, MD	11.800	8.500	DEC-08	7.800	DEC-09			
Systems Engineering	WR	NUWC, Keyport,WA	7.631	2.495	DEC-08	3.300	DEC-09			
Systems Engineering TDCL	CPFF	Ultra, Braintree, MA	10.800	0.400	JUN-09	3.000	FEB-10			
Systems Engineering ATT	WR	ONR	0.835	0.000		0.100	JAN-10			
Systems Engineering TDCL	CPFF	AAC, Hauppage, NY	0.000	1.200	JUN-09	3.000	FEB-10			
Systems Engineering	WR	OPTEVFOR, Norfolk, VA	0.123	0.150	FEB-09	0.150	FEB-10			
Systems Engineering	CPFF	ArgonST, Manassas, VA	0.800	0.000		0.000				
Systems Engineering TDCL	WR	NSWC, Dahlgren, VA	1.250	1.872	NOV-08	1.400	DEC-09			
Systems Engineering TDCL	WR	SPAWAR, San Diego, CA	0.225	0.000		0.000				
Systems Engineering	CPFF	UT/ARL	0.000	0.200	JAN-09	0.200	JAN-10			
Subtotal Product Development			**95.194**	**48.217**		**56.763**				
Remarks:										
Program Management Support	FFP	EG&G Gaithersburg, Md	2.846	0.000		0.000				
Program Management Support	C/CPAF	Tech-Marine Burke, VA	0.000	0.700	MAR-09	0.700	JAN-10			
Travel	PD	PMS 415	0.235	0.075	NOV-08	0.075	NOV-09			
Subtotal Management Services			**3.081**	**0.775**		**0.775**				
Remarks:										
Total Cost			**98.275**	**48.992**		**57.538**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**	PROJECT NUMBER AND NAME **0225/Surface Ship Torpedo Defense (SSTD)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**			PROJECT NUMBER AND NAME **0225/Surface Ship Torpedo Defense (SSTD)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
MILESTONE B		Q4					
CAPABILITIES DEVELOPMENT DOCUMENT (CDD)		Q4					
EDM-2 DESIGN	Q1-Q4	Q1-Q4	Q1				
CDR			Q1				
SYSTEM DEMO TRIAL							
MILESTONE C							
IN-WATER TRIALS (CT)	Q2						
DT/OT TESTS							
OT&E							
FRP							
IOC							
SHIP SYSTEMS							
DCL DEMOS	Q1-Q4						
DDG DEMO		Q3					
ATTDS SPEC		Q2-Q3					
EDM DESIGN		Q1-Q4	Q1-Q2				
EDM BUILD		Q3-Q4	Q1-Q4				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603506N/SURFACE SHIP TORPEDO DEFENSE**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9B54A/Anti-Submarine Warfare (ASW) Enhancements	7.713	0.000	0.000
RDT&E Articles Quantity	0	0	0

Accelerates development of the Anti-Torpedo Torpedo EDM-2 design effort and conducts additional in-water test events on ATT EDM-1 units.

	FY 2008	FY 2009	FY 2010
9B55A/Anti-Torpedo Torpedo (ATT)	2.314	0.000	0.000
RDT&E Articles Quantity	0	0	0

Apply industry cost affordability manufacturability practices (DFA/DFM) to the ATT system design similar to previous successful efforts to reduce ATT subsystem component manufacturing costs.

	FY 2008	FY 2009	FY 2010
9D21A/ Supportability Training Services Infrastructure	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

Develop the Open Architecture (OA) supportability processes, methods, and tools required to facilitate the real-time capture and cataloging of sailor training, performance, and vocational skills data.

	FY 2008	FY 2009	FY 2010
9D22A/ Mobile Acoustic Decoys for Surface Ship Defense	0.000	0.957	0.000
RDT&E Articles Quantity	0	0	0

Expand technology development of mobile countermeasures used for Surface Ship Torpedo Defense including device engineering, fabrication and testing capabilities to assess the effectiveness of Next Generation (mobile) Countermeasures.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603512N/CARRIER SYSTEMS DEVELOPMENT**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	85.742	147.205	173.594				
2208 / CVN 21	44.788	56.597	57.542				
3216 / Tactical Support Center-Integration	0.000	0.000	5.154				
3217 / KU-Band Common Data Link	0.000	0.000	14.562				
4004 / EMALS	35.751	61.498	94.535				
4005 / SMART CARRIER	1.730	1.585	1.801				
9999 / CONGRESSIONAL ADDS	3.473	27.525	0.000				

A. MISSION DESCRIPTION:

This Navy unique program addresses all technology areas associated with Navy/Marine Corps aircraft operations aboard ships. The program includes:

- (U)(2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.

- (U)(3216) - Development of block upgrades of the MH-60R sensor suite into the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC). The CV-TSC provides increased situational awareness to the Carrier Strike Group (CSG) in support of force protection, primarily in the area of Anti Submarine Warfare (ASW). Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and Surface Warfare (SUW) assets (S-3B until retirement, SH-60F helicopter). This project provides the development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.

- (U)(3217) - Development of multi-mission shipboard high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, and completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders.

- (U)(4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch

System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

- (U)(4005) - The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

- (U)(9B59A) - QuIPS provides an automated data fusion system to detect, track, classify, and neutralize threats in the near shore environment. QuIPS is state-of-the-art in algorithm development in non plane wave acoustic beamforming to detect and track surface ship and submerged contacts in very shallow water using matched phase matched field processing, as well as normal plane wave beamformers. Funding provided for the integration of QuIPS with CV-TSC version 6.0 software architecture and development of a portable (2-man lift) hardware system to host the integrated software.

- (U)(9B57A) - Funding provided to enable the proliferation of non-tactical technologies, solution, applications, and systems from submarine nuclear propulsion plants. This effort will ensure that open architecture, open standards software and network design is used in carriers as well as submarines to ensure on life-cycle supportable system is fielded. Efforts include PPKM pilot installation and ongoing shipboard maintenance solution requirements and design work.

- (U)(9B58A) - Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coatings have been exposed up to 7 months now and will continue to be evaluated over the next three years of exposure under simulated flight deck conditions. The funding will also be used to initiate phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armatures life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS for the in-service support of the EMALS system.

- (U) (9D23A) - Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the Undersea Warfare Decision Support System (USW-DSS - AN/UYQ-100), has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks and to provide military commanders with the CTP they need to support critical battle-space decisions. The NSF for Puget Sound Port Security (PSPS) is being developed as an application within the Service Oriented Architecture (SOA) of USW-DSS.

- (U) (9D24A) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved

reliability and maintainability, increased operational availability and reduced operator and maintainer workload.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	86.544	120.511	72.135
FY10 President's Budget	85.742	147.205	173.594
Total Adjustments	-0.802	26.694	101.459
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	-0.001	-0.401	0.000
SBIR/STTR/FTT Assessment	-0.802	0.000	0.000
Program Adjustments	0.001	27.600	102.237
Rate/Misc Adjustments	0.000	-0.505	-0.778
Total	-0.802	26.694	101.459

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **2208/CVN 21**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	44.788	56.597	57.542				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides for the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **2208/CVN 21**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.805	0.000	0.000
RDT&E Articles Quantity	0	0	0

- (U) Non-Nuclear Propulsion Plant Development -

(FY08) Complete MTG shock qualification; transport/disposition MTG generator to designated storage; and transport/disposition MTG turbine.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	39.328	45.822	50.767
RDT&E Articles Quantity	0	0	0

- (U) CVN 21 Advanced Technology Design & Development: Continue development and transition of technologies to support CVN 21 Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new propulsion plant and Electromagnetic Aircraft Launch System, and expand the design build approach to include the whole ship, and to improve overall performance. Technologies and design efforts include, but not limited to:

(FY08 - FY 10) - Continue transition planning and execution, including finishing development work, certification/qualification testing, in-service testing, integrated logistics support and design integration tasks for all projects in the Critical and Non-Critical Technology portfolios. Continue identification of technology opportunities for incorporation into the CVN78. Efforts also encompass those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.655	10.775	6.775
RDT&E Articles Quantity	0	0	0

- (U) CVN 21 - Test & Evaluation -

(FY08) - Commenced Developmental Test (DT) B1 test events which include an assessment of DT-A2 data results, demonstration that the CVN 78 will meet requirements, continuation of PARM interfacing, continuation of model and simulation testing, and management of Test and Evaluation (T&E) risks. Conducted an Operational Test Readiness Review (OTRR) to signal readiness to commence Operational Test (OT) B2 phase design assessments by Commander, Operational Test and Evaluation Forces (COMOPTEVFOR). Participating as a passive observer in a Joint Mission Environment Test Capability (JMETC) sponsored interoperability test event. Planning to commence Change 1 to Test and Evaluation Master Plan (TEMP) 1610, Rev B. started development of a plan/process as an alternative to fulfill the requirements of the Full Ship Shock Trial (FSST) Executing Sortie Generation Rate (SGR) Modeling and Simulation (M&S) improvements to the Virtual Carrier Model (VCVN) to support Initial Operational Test and Evaluation (IOT&E).

Collaborating with the various working groups, COMOPTEVFOR, & Director, Operational Test and Evaluation (DOT&E) to ensure requirements are met for planning of the post delivery test & trials. Compiling and evaluating topside E3 risks.

(FY09) - Execute an alternative to fulfill the requirements of the Full Ship Shock Trial (FSST). Continue DT-B1 efforts to include as assessment of results that will demonstrate the CVN 78 design will meet requirements. Conclude DT-B1 in late FY 09 with a test report. Commence DT planning on C4I equipment and sensors to define and implement interoperability testing. Conduct OTRR to signal readiness to commence OT-B3 phase design assessments by COMOPTEVFOR. Commence planning for DT-B2i Net-Ready/Interoperability Event. Continue planning/execution of SGR M&S improvements to the VCVN Model. Continue planning of post delivery test and trials with various working groups, COMOPTEVFOR, and DOT&E to ensure requirements are met. Finalize Change 1 to TEMP 1610, Rev B. Continue to evaluate Topside E2 risks.

(FY10) - Commence OT-B3 and continue DT-B2 T&E planning efforts. Plan/execute alternative to fulfill the requirements of the FSST. Plan for and execute DT-B2i Net-Ready/Interoperability Event. Commence DT on C4I equipment and sensors to define and implement interoperability testing to support JITC certification. Continue collaboration with the various working groups, COMOPTEVFOR , & Director, Operational Test and Evaluation (DOT&E) to ensure requirements are met for planning of the post delivery test & trials. Continue planning/execution of SGR M&S improvements to the VCVN Model to ensure COMOPTEFOR IOT&E requirements are met. Continue E3 Topside risk evaluation.

C. OTHER PROGRAM FUNDING SUMMARY:

* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0603570N (PU 2692).
* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0604567N (PU 3108, 3179, 4007, 4008, 9C20A).

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
BLI 200100 Carrier Replacement Program	3,145.026	3,915.642	1,223.701						

Related RDTEN: PE 0604567N Ship Contract Design, Live Fire T&E, PE 0603570N Adv. Nuclear Power Systems

D. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **2208/CVN 21**

E. MAJOR PERFORMERS:

Northrop Grumman Ship Building-Newport News, Newport News, VA, Design / Component Development / Construction

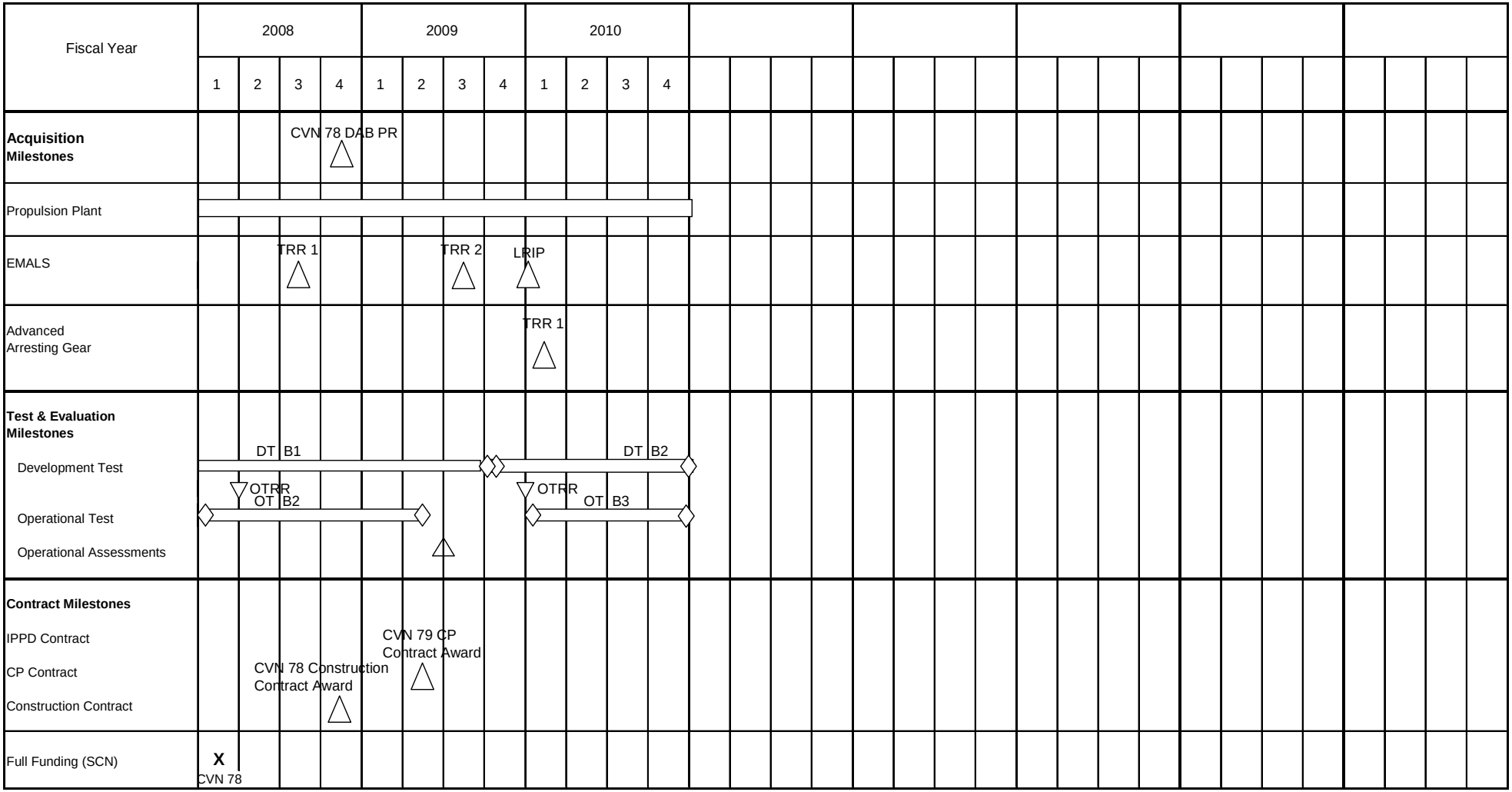
Naval Surface Warfare Center, Carderock, MD, Technology Design & Development

Naval Surface Warfare Center, Dahlgren, VA, Technology Design & Development

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **2208/CVN 21**						
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			
Propulsion Plant Development	SS,CPFF	BETTIS, PA	71.627			0.000		0.000				
	CPFF	NGSB-NN	164.409			0.000		0.000				
	Various	Miscellaneous	10.562			0.000		0.000				
	WR	NSWC Carderock	0.050			0.000		0.000				
Advanced Design & Development	CPAF	NGSB-NN	120.546			13.528	NOV-08	16.596	NOV-09			
	WR	NSWC Carderock	70.183			0.976	OCT-08	0.500	OCT-09			
	CPFF	SAIC	48.070			1.000	DEC-08	2.243	DEC-09			
	WR	NAWCAD Pax River	30.145			9.060	OCT-08	9.691	OCT-09			
	WR	NAWC Lakehurst	7.539			0.650	OCT-08	0.000	OCT-09			
	WR	NSWC Dahlgren	14.274			4.875	OCT-08	5.095	OCT-09			
	CPAF	Raytheon	14.827			5.828	DEC-08	5.978	DEC-09			
	WR	NSWC Port Hueneme	5.538			0.000	OCT-08	0.000	OCT-09			
	WR	SPAWAR	7.811			0.871	OCT-08	1.200	OCT-09			
	CPFF	NAVSEA SEAPORT	20.276			4.374	DEC-08	4.957	DEC-09			
	Various	Miscellaneous	36.436			4.660	OCT-08	4.637	DEC-09			
Subtotal Product Development			**622.293**			**45.822**		**50.897**				
Remarks:												
Developmental Test & Evaluation	CPAF	NGSB-NN	4.634			3.612	NOV-08	1.348	NOV-09			
	WR	NAWCAD Pax River	9.821			1.360	OCT-08	2.087	OCT-09			
	WR	NSWC Dahlgren	2.434			0.380	OCT-08	0.230	OCT-09			
	WR	NSWC Carderock	3.602			2.695	OCT-08	0.500	OCT-09			
	WR	SPAWAR	2.131			0.730	OCT-08	0.550	OCT-09			
	CPFF	NAVSEA SEAPORT	0.075			0.000		0.000				
	CPAF	Raytheon	0.735			0.050	DEC-08	0.075	DEC-09			
	Various	Miscellaneous	4.408			1.070	OCT-08	0.940	OCT-09			
Operational Test & Evaluation	WR	COMOPTEVFOR	2.793			0.878	OCT-08	0.915	OCT-09			
Subtotal Test and Evaluation			**30.633**			**10.775**		**6.645**				
Remarks:												

CLASSIFICATION:	UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **2208/CVN 21**					
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			**652.926**			**56.597**		**57.542**			

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **2208/CVN 21**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**			PROJECT NUMBER AND NAME **2208/CVN 21**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
CVN 78 DAB PR	4Q						
Developmental Tests DT-B1	1-4Q	1-4Q					
Operational Tests OT-B2	1-4Q	1-2Q					
EMALS TRR 1(HALT/HCT)	3Q						
AAG TRR 1 (IT)			1Q				
CVN 78 Construction Contract Award	4Q						
CVN 78 SCN Full Funding	1Q						
Developmental Tests DT-B2		4Q	1-4Q				
Operational Tests OT-B3			1-4Q				
EMALS TRR 2 (DT/OA)		3Q					
EMALS LRIP		4Q	1Q				
Operational Test Readiness Reviews	2Q		1Q				
Operational Assessments		2-3Q					
CVN 79 CP Contract Award		2Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **3216/Tactical Support Center-Integration**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	5.154				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The CV-TSC program provides increased situational awareness to the CSG in support of force protection, primarily in the area of ASW. Through the integration of off-board sensors and signal, data and display processors, the AN/SQQ-34 is utilized in detecting, classifying, and localizing threats. An integrated element of the Carrier Combat System, the AN/SQQ-34 supports the tactical deployment of embarked ASW and SUW assets (S-3B until retirement, SH-60F helicopter). This project provides the design, development and engineering foundation to refresh legacy AN/SQQ-34 systems on all Carriers and shore sites in support of fleet introduction and shipboard integration of the MH-60R Multi Mission Helicopter. Upgrades to legacy systems will enable exchange of sensor, tactical and imagery data with the MH-60R initially and eventually with P-8 and BAMS aircraft.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603512N/CARRIER SYSTEMS DEVELOPMENT**	**3216/Tactical Support Center-Integration**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
MH-60R Integration Development for CV-TSC	0.000	0.000	5.154
RDT&E Articles Quantity	0	0	0

FY10: Design and develop the AN/SQQ-34 upgrade to support the MH-60R Multi Mission Helicopter.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
OPN/BLI 2176/USW Support Equipment (Grand Total BLI)	14.805	15.532	38.705						
OPN/BLI 2176/USW Support Equipment (Related N88 MH-60R Portion)	0.000	0.000	17.966						

D. ACQUISITION STRATEGY:

The CV-TSC will be upgraded to support full deployments of KU-Band equipped MH-60R aircraft. The CV-TSC development activity is a government field activity, Naval Undersea Warfare Center, Division Keyport. Hardware procurements and back fit of the CV-TSC will use the AN/SQQ-34C as a baseline with additional hardware necessary for MH-60R support. Hardware shall be procured via a Request For Proposal (RFP) with industry. To the maximum extent possible, CV-TSC will use enterprise hardware initiatives being developed by the Navy in support of DDG-1000 and Aegis Modernization.

E. MAJOR PERFORMERS:

NAVSEA, Keyport, WA - Non/Recurring Engineering, Software Development

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**					PROJECT NUMBER AND NAME **3216/Tactical Support Center-Integration**					
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			
Non-Recurring Engineering	WR	NAVSEA/Keyport, WA	0.000			0.000		3.500	OCT-09			
System Eng / S/W Development	WR	NAVSEA/Keyport, WA	0.000			0.000		1.654	OCT-09			
Subtotal Product Development			**0.000**			**0.000**		**5.154**				
Total Cost			**0.000**			**0.000**		**5.154**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **3216/Tactical Support Center-Integration**

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4																				
Increment Development (Initial MH-60R Capabilities) Verification and Validation (post FY10) Combat System Certification (post FY10)																																
Increment Development (MH-60R Block Upgrades) (post FY10) Verification and Validation (post FY10) Combat System Certification (post FY10) OPEVAL (post FY10)																																
Fielding Plan (post FY10)	Note - Systems will be fielded with hardware and baseline AN/SQQ-34(V) software required to support initial MH-60R deployments. As new software is developed and certified, it will be delivered to the CVN as a sofware-only change.																															

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**			PROJECT NUMBER AND NAME **3216/Tactical Support Center-Integration**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Initial MH-60R Capabilities Development			1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **3217/KU-Band Common Data Link**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	14.562				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Develops a multi-mission, shipboard, high data rate Ku-Band data link between the embarked air assets and the Carrier combat system, enabling exchange of sensor, tactical and imagery data initially with the MH-60R Multi Mission Helicopter. It also provides capability for on-the-deck mission synchronization with MH-60R. Eventually, the KU-band data link will support other Ku-Band equipped aircraft, including the P-8 and BAMS. This effort will provide the Carrier with the capability to support multiple simultaneous aircraft on different missions, also completing the Kill Chain by linking sensor platform to sensor controllers and the ASW/SUW warfare commanders. This development effort will support the initial deployments of the Ku-Band equipped MH-60R Air wing for new construction Carriers, RCOH Carriers, and NIMITZ class back fits.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603512N/CARRIER SYSTEMS DEVELOPMENT**	**3217/KU-Band Common Data Link**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Common Data Link Development	0.000	0.000	14.562
RDT&E Articles Quantity	0	0	0

FY10 - Development of Ku-Band data link between the embarked air assets and the Carrier combat system.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
OPN/BLI 2176/USW Support Equipment (Grand Total BLI)	14.805	15.532	38.705						
OPN/BLI 2176/USW Support Equipment (Related N88 CDL Portion)	0.000	0.000	6.151						

D. ACQUISITION STRATEGY:

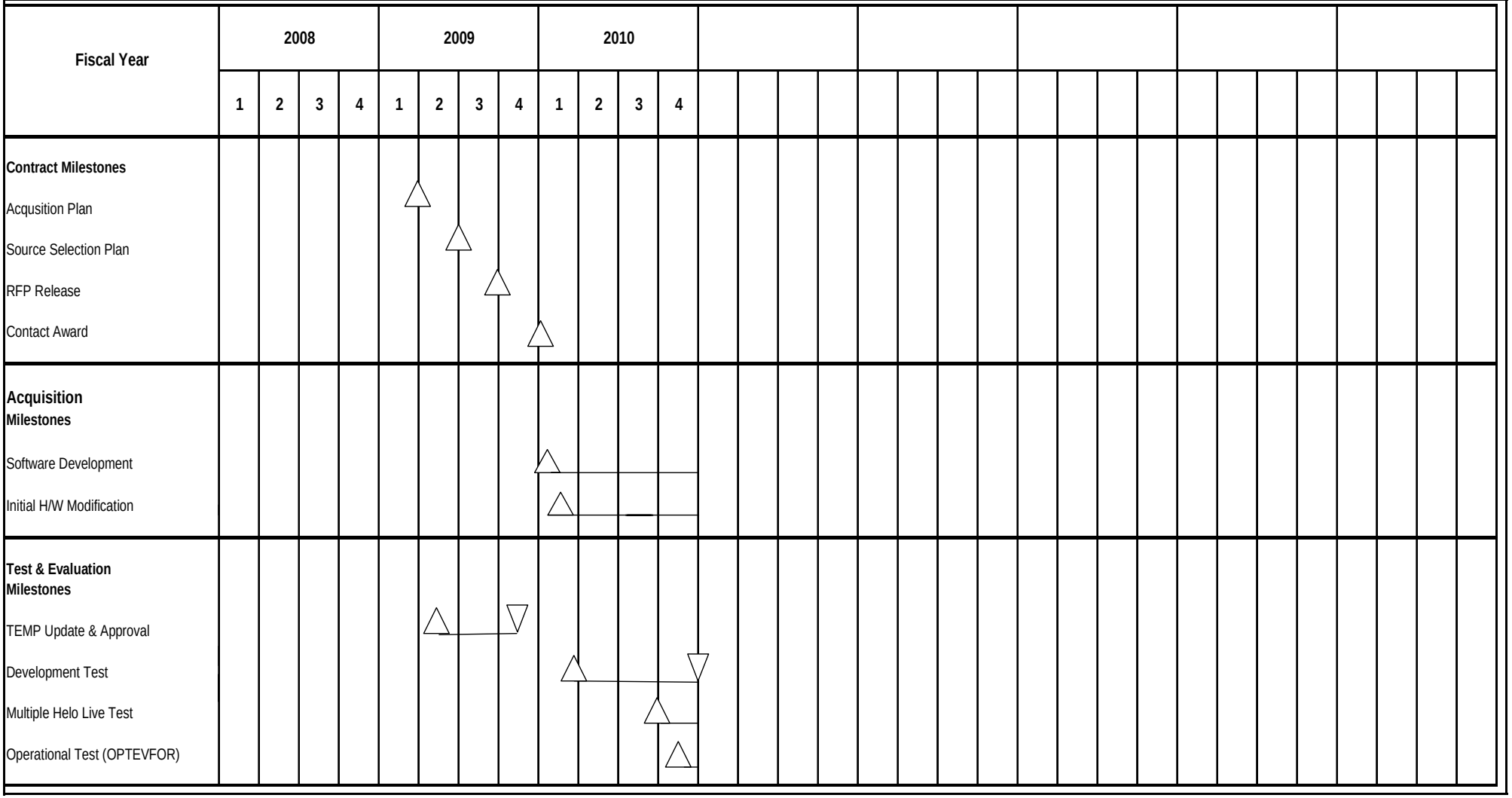
The KU-Band Common Data Link will be upgraded on the Carrier to support full deployments of KU-Band equipped MH-60R aircraft. The required development for this effort will be completed in FY10. Procurements and back fit of the Ku-Band capability will be fielded in beginning after FY10. PEO C4I shall develop the additional capabilities by implementing an Engineering Change Proposal (ECP) to the AN/USQ-167 Communications Data Link System (CDLS). ECP implementation shall be procured via a Request For Proposal (RFP) with industry. This would ensure the most efficient and cost effective implementation for Navy.

E. MAJOR PERFORMERS:

Program Executive Office Command, Control, Communications, Computers & Intelligence (PEO C4I) SPAWAR Systems Center, San Diego, CA
Technology Unlimited Group (TUG), San Diego, CA
Industry Hardware Provider (TBD)

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009				
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **3217/KU-Band Common Data Link**						
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			
NonRecurring Engineering	CPFF	TBD	0.000			0.000		5.228	OCT-09			
Recurring Engineering	FFP	TBD	0.000			0.000		2.574	OCT-09			
System Eng / Software Development	CPFF	Technology Unlimited Group, CA	0.000			0.000		4.353	OCT-09			
Integrated Logistics Support	TBD	SPAWAR Systems Center, CA	0.000			0.000		0.550	OCT-09			
Integration and Test	TBD	SPAWAR Systems Center, CA	0.000			0.000		1.086	OCT-09			
Subtotal Product Development			**0.000**			**0.000**		**13.791**				
Remarks:												
Test and Certification	TBD	SPAWAR Systems Center, San Diego CA	0.000			0.000		0.771	OCT-09			
Subtotal Test and Evaluation			**0.000**			**0.000**		**0.771**				
Remarks:												
Total Cost			**0.000**			**0.000**		**14.562**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **3217/KU-Band Common Data Link**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**			PROJECT NUMBER AND NAME **3217/KU-Band Common Data Link**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Acquisition Plan		1Q					
Source Selection Plan		2Q					
RFP Release		3Q					
Contract Award		4Q					
Software Development			1-4Q				
Initial Hardware Development			1-4Q				
Temp Update/Approval		2Q-4Q					
Development Test			1-4Q				
Operational Test (Multiple Helo Live Test)			4Q				
Operational Assessment (OPTEVFOR)			4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **4004/EMALS**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	35.751	61.498	94.535				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 and follow-on ships of the CVN 78 Class. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **4004/EMALS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	35.751	61.498	94.535
RDT&E Articles Quantity	0	0	0

-(U) EMALS -

FY-08: Continue System Development and Demonstration phase. Continue shipboard representative system development effort. Manufacture and installation of a shipboard representative system into the land based test facility. Initiate High Cycle and Life Testing. Continue CVN 78 integration development. Provide management, systems engineering, test, and ship integration support.

FY-09: Continue System Development and Demonstration phase. Continue shipboard representative system development effort. Complete installation of shipboard representative system into the land based test facility and commission land based test site. Initiate System Integration and Environmental Testing and Highly Accelerated Life cycle Testing. Continue High Cycle and Life Testing. Provide management, systems engineering, test, and ship integration support.

FY-10: Continue System Development and Demonstration phase. Continue CVN78 integration development. Provide management, systems engineering, test, and ship integration support. Continue System Integration and Environmental Testing. Complete High Cycle and Life testing and Highly Accelerated Life cycle Testing. Initiate land-based System Verification Testing.

C. OTHER PROGRAM FUNDING SUMMARY:

* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0603570N (PU 2692).
* Note: Only the portion of funding related to the CVN 78 Class Program is included for PE 0604567N (PU 3108, 3179, 4007, 4008, 9C20A).

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
BLI 200100 Carrier Replacement Program	3,145.026	3,915.642	1,223.701						

Related RDTEN: PE 0604567N Ship Contract Design, Live Fire T&E, PE 0603570N Adv. Nuclear Power Systems

D. ACQUISITION STRATEGY:

The CVN 78 will be the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system, advanced arresting gear system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship

self defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

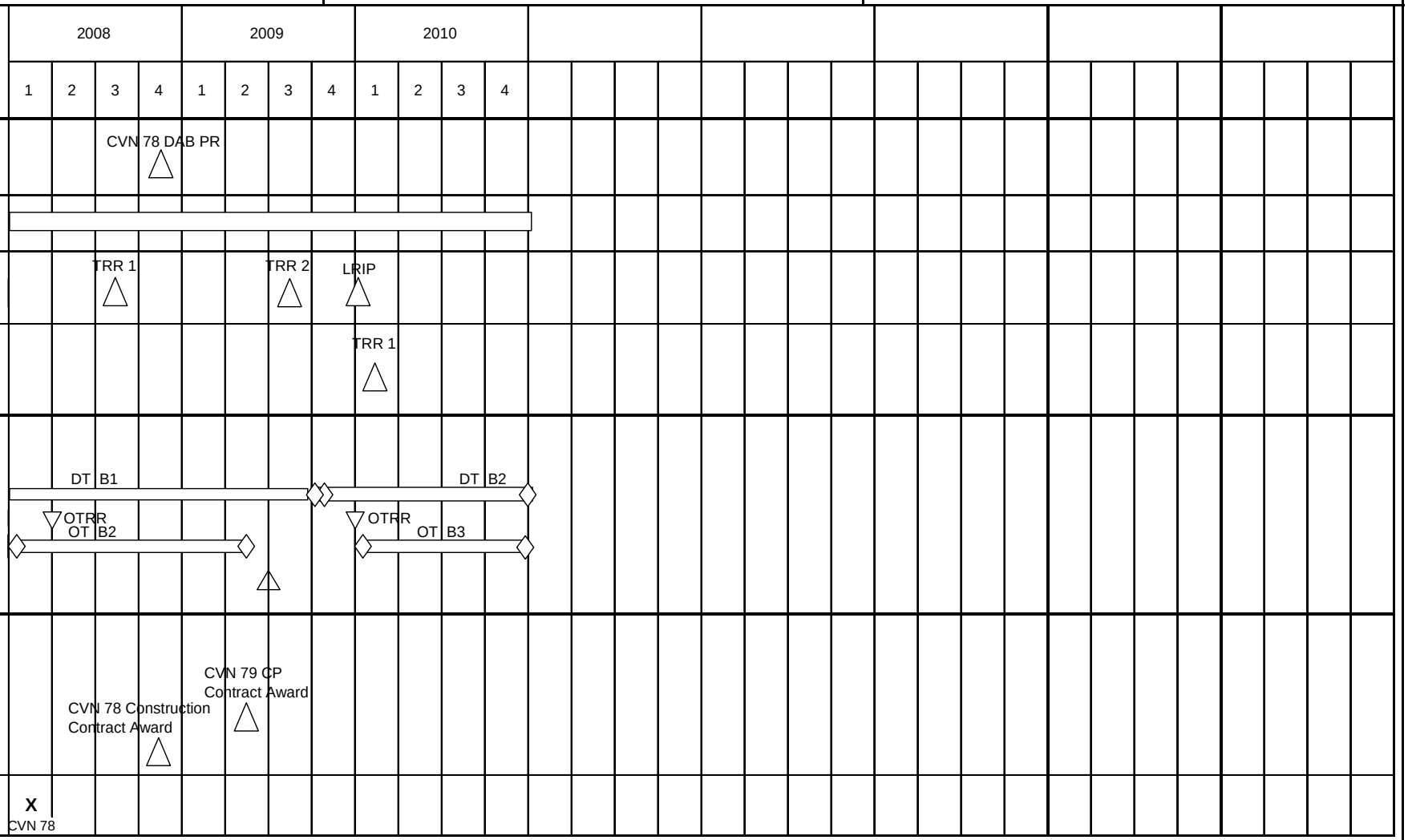
E. MAJOR PERFORMERS:

General Atomics, San Diego, CA, EMALS Design and Development

Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ: EMALS Development and Test.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **4004/EMALS**						
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			
Aircraft Launch, Recovery & Support	CPAF	Northrop Grumman	83.352			0.000		0.000				
	CPAF	General Atomics (PDRR)	82.719			0.000		0.000				
	CPAF	General Atomics (SDD)	218.368			35.801	DEC-08	67.498	DEC-09			
	WR	NAWC Lakehurst	34.457			7.047	DEC-08	3.200	NOV-09			
	CPAF	NGSB-NN	2.536			0.000		0.000				
	Various	Miscellaneous	1.442			1.859	DEC-08	0.020	DEC-09			
	CPAF	General Atomics (SDD) - Award Fee	3.819			1.900	DEC-08	8.100	DEC-09			
Subtotal Product Development			**426.693**			**46.607**		**78.818**				
Remarks: A $36.9 million FY 07 prior approval reprogramming was approved in April 2008 and is included in Total Prior Year Cost.												
Aircraft Launch, Recovery & Support	WR	NAWC Lakehurst	27.954			14.891	DEC-08	15.717	DEC-09			
Subtotal Test and Evaluation			**27.954**			**14.891**		**15.717**				
Remarks: .												
Total Cost			**454.647**			**61.498**		**94.535**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **4004/EMALS**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**			PROJECT NUMBER AND NAME **4004/EMALS**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
CVN 78 DAB PR	4Q						
Developmental Tests DT-B1	1-4Q	1-4Q					
Operational Tests OT-B2	1-4Q	1-2Q					
EMALS TRR 1(HALT/HCT)	3Q						
AAG TRR 1 (IT)			1Q				
CVN 78 Construction Contract Award	4Q						
CVN 78 SCN Full Funding	1Q						
Developmental Tests DT-B2		4Q	1-4Q				
Operational Tests OT-B3			1-4Q				
EMALS TRR 2 (DT/OA)		3Q					
EMALS LRIP		4Q	1Q				
Operational Test Readiness Reviews	2Q		1Q				
Operational Assessments		2-3Q					
CVN 79 CP Contract Award		2Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **4005/SMART CARRIER**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.730	1.585	1.801				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Smart Carrier Demonstration and Validation program exploits available technologies to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture, requirements/specification development, technology selection, software development (including software baseline), as well as land-based and shipboard testing of new technologies to improve shipboard operations and to reduce workload, manpower requirements, and Total Ownership Costs. Initial technologies include Aviation Fuels (JP-5) Automation, the Advanced Damage Control System (ADCS), Automated Material Handling Systems, Damage Control Inventory Management and Stowage System (DCIMSS), List Control, Firemain Control, Integrated Condition Assessment System, Interior Communications/Systems Monitoring Alarm Upgrades, and the Digital Video Surveillance System. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, Electronic Valve Operator automation, Superior Sound Technology, Vibration Monitoring/Rotating Machinery Diagnostic Tools, Flat Plane Speakers, Smart Circuit Breakers, Distilling Unit Automation, Reboiler Automation, In-line Aviation Fuels Sampling, Advanced Oil Purification System, Oil Monitoring Sensors, and Voice Interactive Display. Wireless systems, smart sensors, knowledge-based systems, automated casualty control, automated technology for workload reduction, linked smart devices, common software tools for interoperability, and self-healing network are technologies being considered for future applications.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **4005/SMART CARRIER**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.730	1.585	1.801
RDT&E Articles Quantity	0	0	0

(U) Smart Carrier - Fiscal Year 2008 efforts will complete ADCS software improvements for installation in USS NIMITZ (CVN68) and continue Aviation Fuels Electric Valve Operator automation, as well as initiate the development and testing of Superior Sound Technologies for shipboard announcing systems. Other initiatives include starting the Input Output Controller (IOC) replacement project; Identify, develop and test a shipboard qualified Uninterruptible Power System (UPS) to replace existing obsolete 15KVA UPS SYSTEMS meeting Mil Spec requirements; and conduct a conceptual study to improve the operational capacity of CVN68 Class 363-ton air conditioning plant. Develop a shipboard AC Plant model.

Fiscal Year 2009 efforts will complete Aviation Fuels Electric Valve Operator automation and the development/testing of Superior Sound Technologies for shipboard announcing systems for implementation in USS RONALD REAGAN (CVN76), and initiate software development of vibration monitoring/rotating machinery diagnostic tools and software development for expanded condition-based maintenance for rotating machinery.

Future efforts in Fiscal Year 2010 and beyond include reboiler automation, liquid load management, advanced fire and smoke sensors, and Integrated Condition Assessment System software improvements, all via modifications and improvements to the existing Smart Carrier hardware and software suite. Also, conduct research and development of a Smart Automated Oil Pollution Abatement (AOPA) System on board Smart Carrier CVN68 Class ships.

C. OTHER PROGRAM FUNDING SUMMARY:

* LT140 is the cost code for Smart Carrier funding in 0981 budget. "Other program funding summary" reflects LT140 only and not the entire 0981 line total.

Line Item No. and Name	FY 2008	FY 2009	FY 2010						
098100 Items Under $5M Smart Carrier (LT 140)	13.612	15.329	17.099						

D. ACQUISITION STRATEGY:

Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC).

E. MAJOR PERFORMERS:

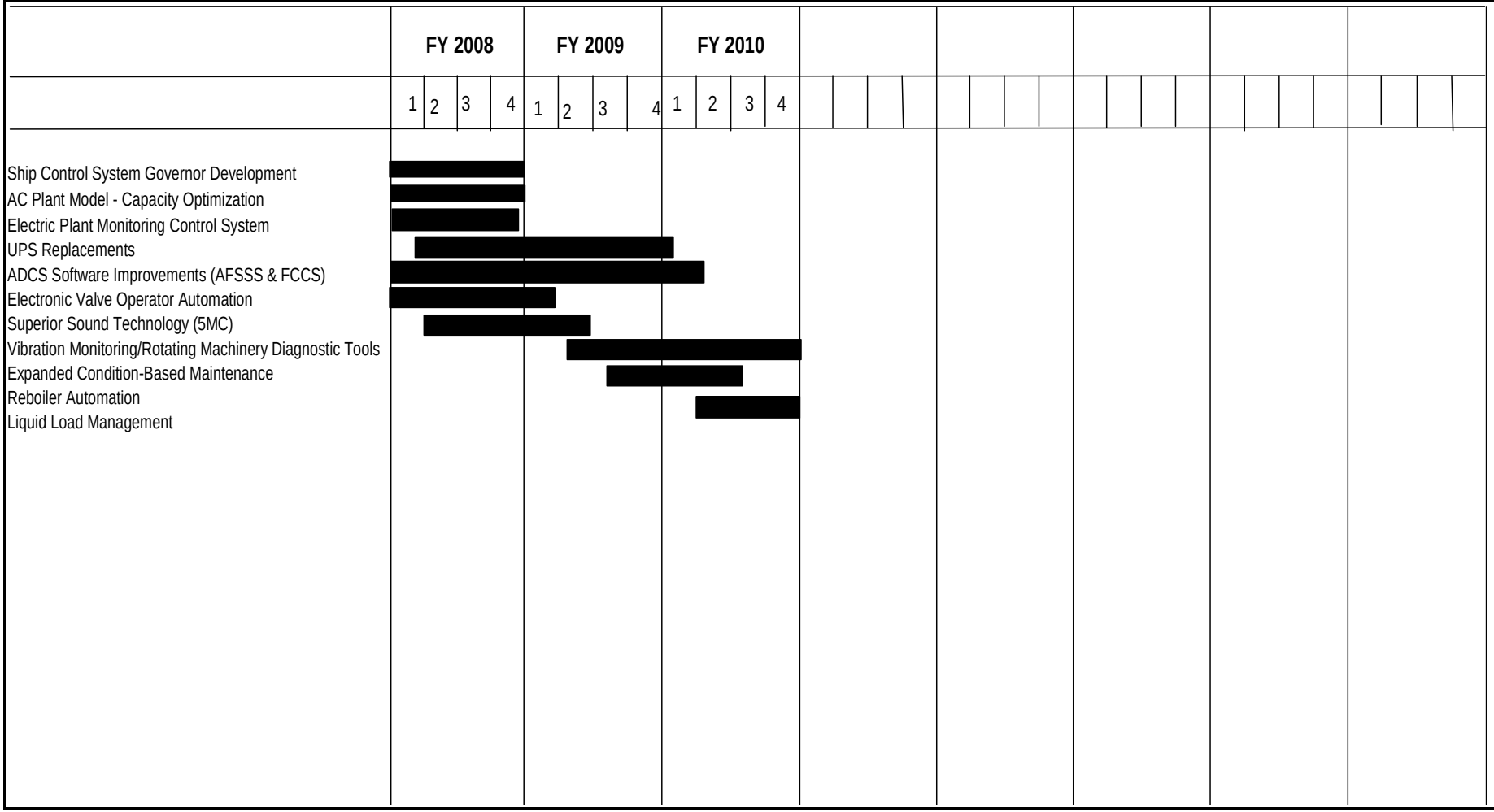
Naval Sea Systems Command - Philadelphia (formerly Naval Surface Warfare Center, Carderock Division), Philadelphia, PA performs software development, test and evaluation, integration and program management to include training development and integrated logistics support development. Funds are typically issued in the first fiscal quarter.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **4005/SMART CARRIER**

* Smart Carrier merges with the Aircraft Carrier Machinery Plant Upgrades procurement program beginning in FY12

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**				PROJECT NUMBER AND NAME **4005/SMART CARRIER**						
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
Ship Integration	WR	NAVSEA, Phil.	0.720			0.120	NOV-08	0.125	NOV-09			
Systems Engineering	CPAF	NGNN, VA	0.205			0.000		0.000				
	Various	Miscellaneous	7.978			0.000		0.000				
Subtotal Product Development			**8.903**			**0.120**		**0.125**				
Remarks:												
Software Development	WR	NAVSEA, Phil.	5.030			0.565	NOV-08	0.651	NOV-09			
Training Development	WR	NAVSEA, Phil.	0.390			0.080	NOV-08	0.095	NOV-09			
Integrated Logistics Support	WR	NAVSEA, Phil	0.760			0.120	NOV-08	0.200	NOV-09			
Subtotal Development Support			**6.180**			**0.765**		**0.946**				
Remarks:												
Developmental Test & Evaluation	WR	NAVSEA, Phil	2.436			0.450	NOV-08	0.470	NOV-09			
Subtotal Test & Evaluation			**2.436**			**0.450**		**0.470**				
Remarks:												
Program Management Support	WR	Navsea, Phil.	1.500			0.250	NOV-08	0.260	NOV-09			
Subtotal Support Services			**1.500**			**0.250**		**0.260**				
Remarks:												
Total Cost			**19.019**	**0.000**		**1.585**		**1.801**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **4005/SMART CARRIER**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**			PROJECT NUMBER AND NAME **4005/SMART CARRIER**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
UPS Replacements	2Q	1-4Q	1Q				
Ship Control System Governor Software Development	1-4Q	1-4Q					
AC Plant Model - Capacity Optimization	1-4Q						
Electric Plant Monitoring Control System	1Q						
ADCS Software Improvements (AFSSS/FCCS) Software Development Test	1Q	1-4Q	1Q				
Electronic Valve Operator Automation Software Development	1Q						
Electronic Valve Operator Automation Software Development Test	2-4Q	1Q					
Superior Sound Technology (5MC) Development/Integration	2-4Q	1-3Q					
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Development		1-4Q	1-2Q				
Vibration Monitoring/Rotating Machinery Diagnostic Tools SW Dev. Test			3-4Q				
Expanded Condition-Based Maintenance - Rotating Machinery		3-4Q	1-3Q				
Reboiler Automation SW/HW Development			1-4Q				
Liquid Load Management SW Development/Test			3-4Q				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9B59A Quiet Interlude Processing System (QuIPS)	0.774	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding provided to continue the integration of QuIPS with CV-TSC version 6.0 software architecture and develop a portable (2-man lift) hardware system to host the integrated software. Developed and integrated data fusion algorithms and software to fuse short range, relatively accurate, time dense tactical sensor ship track data with global, relatively inaccurate, time sparse national sensor ship track data. Developed and integrated data fusion algorithms and software to fuse non acoustic Latitude/Longitude vs. time tracks with acoustic sonar true bearing vs. time tracks output by most Navy sonar. There is a requirement for a portable tactical situational awareness system that can take inputs from multiple sensor types; fuse sensor detection reports, contact reports and tracks into composite tracks; display both independent contacts and composite tracks on a GIS display; and allow operator drill-down capability to underlying metadata. This portable system supports a number of mission scenarios including Anti-Terrorism, Force Protection and Expeditionary Naval Coastal Warfare.

	FY 2008	FY 2009	FY 2010
9B57A Carrier Plant Automation and Manning Reduction Technology Insertion	0.771	0.000	0.000
RDT&E Articles Quantity	0	0	0

To enable the proliferation of non-tactical technologies, solution, applications, and systems from submarine propulsion plants into aircraft carrier nuclear propulsion plants. This effort will ensure that open architecture, open standards software and network design is used in carriers as well as submarines to ensure one life-cycle supportable system is fielded. Efforts include PPKM pilot installation and ongoing shipboard maintenance solution requirements and design work.

	FY 2008	FY 2009	FY 2010
9B58A Improved Corrosion Protection for Electromagnetic Aircraft Launch System	1.928	1.995	0.000
RDT&E Articles Quantity	0	0	0

Funding will be used to continue ongoing corrosion testing at Ocean City Research Testing facility in NJ. Various coupons and coating have been exposed up to 7 months now and will continue to be evaluated up to 3 years of exposure under simulated flight deck trough conditions. The funding will also be used to initiate a phase 2 study into the development of a corrosion inhibitor addition to the armature cooling to extend the armature's life. Phase one identified several candidates which look promising. The remainder of the funds will be utilized to interrogate and document the material properties of the alloys selected for use on EMALS. Fatigue and fracture data will be compiled under the unique conditions of the EMALS trough for in-service support of the EMALS system.

	FY 2008	FY 2009	FY 2010
9D23A National Sensor Fusion Support for Puget Sound Port Authority	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to incorporate National Sensors data into a fusion engine in order to provide a complete and accurate Common Tactical Picture (CTP) of the surface and subsurface threat environment to the at-sea Warfare Commanders. The National Sensor Fusion Configuration Item (NSFCI), as an integral part of the AN/UYQ-100, has demonstrated the capability to collect and integrate a wide variety of disparate geospatial and sensor data, to fuse the available data sources into real time vessel tracks

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603512N/CARRIER SYSTEMS DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

and to provide military commanders with the CTP they need to support critical battlespace decisions. The NSF for PSPS is being developed as an application within the Service Oriented Architecture (SOA) of the Undersea Warfare - Decision Support System (USW-DSS) (AN/UYQ-100).

	FY 2008	FY 2009	FY 2010
9D24A EMALS	0.000	23.934	0.000
RDT&E Articles Quantity	0	0	0

Funding will be used to support additional scope of work resulting from complex ship integration, a re-planned Test and Evaluation Program to reduce risks for CVN 78, incorporation of the Production Assessment Review findings and the escalated costs of steel, copper and other materials. Additionally, the funding supported resolution of technical problems associated with Factory Acceptance Testing of the Power Conversion Subsystem, the Prime Power Interface Subsystem and Motor-Generator #4. The associated impacts caused test start delays for High Cycle Test Phase II and Highly Accelerated Life Testing.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	42.565	26.824	1.691				
2465 / DC/SURVIVABILITY	1.648	0.000	0.000				
2468 / Undersea Warfare	0.000	0.000	0.000				
2469 / Open System Architecture (OSA)	1.575	0.861	1.691				
2470 / ITD-Integrated Topside Design	0.401	0.011	0.000				
2471 / Integrated Power Systems (IPS)	5.534	3.115	0.000				
4019 / Radar Upgrades	0.000	0.000	0.000				
9999 / CONGRESSIONAL ADDS	33.407	22.837	0.000				

A. MISSION DESCRIPTION:

This PE funds the development of shipboard system components and technologies for the future surface combatant family of ships and focuses on the following efforts: (1) development of DDG 1000 specific and future surface combatant survivability and damage control/firefighting systems and features that reduce vulnerability against weapons, (2) implements modular standard open systems architecture at the total ship/system level and supports reduced manning efforts through automation, (3) develops technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface ships, and (4) supports the Integrated Power System effort that provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system.

The following Congressional adds are contained in this Program Element:

FY 08 Congressional Adds

Project 9999 - Congressional Adds: $33,407-This project consists of the following FY 08 Congressional adds: Advanced Navy Boat Lift Research and Development, Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for Expeditionary Navy, Air Gun Ship Shock Testing of Naval Vessels, Circuit Breaker for Navy Shipboard Power Distribution, High Efficiency Quiet Electric Drive, High Temperature Superconducting Motor for DDG 1000, Integrated Power System Converter, Internet Protocol Over Power Line Carrier Technology, Naval Flywheel Energy Storage System, Smart Valve, Shipboard Wireless Maintenance Assistant, Advanced Steam Turbine, DDG-51 Homopolar Hybrid Drive, MTTC/IPI and National Surface Treatment Center, Power Conversion Equipment for High Density Power, Propulsor Manufacturing Technology Development, and High Temperature Superconductor AC Synchronous Propulsion Motor.

FY09 Congressional Adds:

Project 999 - Congressional Adds: $22,837 - this project consists of the following FY09 Congressional Adds: Advanced Fluid Controls for Shipboard Applications, Advanced Repair Technology for the Expeditionary Navy, Advanced Steam Turbine, Integrated Power System Converter, Smart Valve, DDG-51 Hybrid Drive System, Mobile Valve and Flex Hose Maintenance

(MVFM), Power Dense Integrated Power System for CG(X), Extreme Torque (XTM) Propulsion Motor, Data Acquisition Reporting and Trending System (DARTS), Infrared LED Free Space Optics Communications Advancement, and Landing Craft Composite Lift Fan.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	43.529	4.003	7.781
FY10 President's Budget	42.565	26.824	1.691
Total Adjustments	-0.964	22.821	-6.090
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	22.827	0.000
SBIR/STTR/FTT Assessment	-0.952	0.000	0.000
Program Adjustments	0.000	0.000	-6.072
Rate/Misc Adjustments	-0.012	-0.006	-0.018
Total	-0.964	22.821	-6.090

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2465/DC/SURVIVABILITY**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.648	0.000	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project funds development of DDG 1000 specific and future surface combatant survivability and damage control (DC)/ firefighting systems and features that reduce vulnerability against weapons (e.g., missiles, mines, torpedoes) and enables effective recovery of mission capability under reduced manning conditions. Additionally, this project supports development of systems that reduce susceptibility to magnetic and acoustic influence mines. The requirements for this project are based on the need to develop affordable, balanced survivability designs that address recent wartime lessons learned and emerging and future threats.

System development areas include: 1) development of electrical fault isolation control methods that enable the rapid detection and isolation of combat-induced faults ensuring an effective DC response after damage, 2) wireless machinery control system technologies that will reduce installation costs through the elimination of wires and significantly increase the survivability of control systems ensuring the availability of mission critical systems following damage, and 3) development of electromagnetic signature reduction technologies that provide for jamming sweep resistant magnetic influence mines using advanced degaussing and impressed cathodic protection systems and a closed-loop deamping system that uses existing cathodic protections systems to reduce the near field electric signatures emanating from a steel hulled surface ship.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2465/DC/SURVIVABILITY**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.693	0.000	0.000
RDT&E Articles Quantity	0	0	0

For 08, developed wireless machinery control system approaches and architectures that significantly improved survivability and reduced installation costs through the elimination of cabling. Integrated a commercial wireless fire detection system/sensors with a representative ship level supervisory control system and developed architecture options.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.955	0.000	0.000
RDT&E Articles Quantity	0	0	0

In FY 08 developed advanced electromagnetic (EM) signature reduction technology requirements and architecture options for a closed-loop deamping system that reduced the near field electric signature and a system for jamming magnetically influenced mines.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

Government Field Activities - Naval Surface Warfare Center, Carderock, Md.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.575	0.861	1.691				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Architectures, Interfaces & Modular Systems (AIMS): This funding supports PEO Ships implementation of Modular Standard Open Systems Architecture (MOSA) at the total system/ship level. These modular interfaces facilitate mission and market adaptability, technology refresh and insertion, and competition. This funding supports the market surveillance and technology and other projections, cost and logistics analyses, process development, industry partnering, demonstrations and assessments necessary to translate into total ship acquisition.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.726
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Total Open Shipboard Applications and Concepts: FY10: Assess feasibility of open system/modular application to total ship levels, develop interface plan.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.300	0.276	0.541
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Sensors Zone: FY 08: Architectures Developed; FY 09: Continue Architecture Development; FY 10: Interface Development.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.539	0.388	0.215
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Machinery Zone: FY08-09 Architecture Concept; FY 10: Develop architectures.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.736	0.197	0.209
RDT&E Articles Quantity	0	0	0

Implementation: Transition with industry common Architectures, Interfaces, and Modular Systems (AIMS) for shipboard zones.

A. Open Weapons/Power Projection Zone: FY08: Interfaces developed; FY09-10: Interface Implementation.

C. OTHER PROGRAM FUNDING SUMMARY:

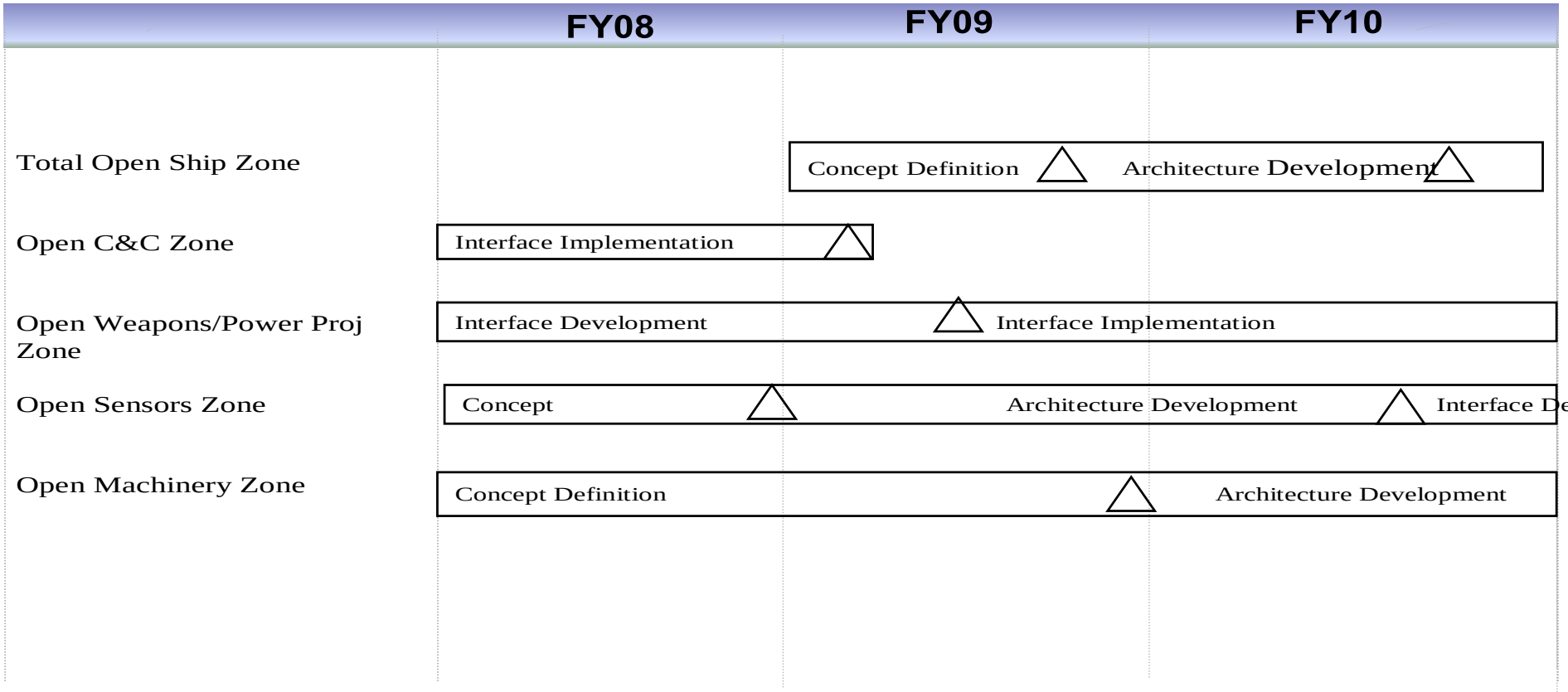
D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

(U) Government Field Activities- Naval Surface Warfare Center, Carderock, Md.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**					PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**					
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			Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Primary Hardware Development	845/804	DDG 1000 Industry Teams	35.327	0.000		0.000				0.000	35.327	35.327
Primary Hardware Development	WR	NSWC CD Bethesda, MD	10.023	0.000		0.000				0.000	10.023	0.000
Primary Hardware Development	Various	Other Gov't Activities	4.987	0.000		0.000				0.000	4.987	0.000
Primary Hardware Development	Various	Other Contractors	2.735	0.000		0.000				0.000	2.735	2.735
Subtotal Product Development			**53.072**	**0.000**		**0.000**				**0.000**	**53.072**	**38.062**
Remarks:												
Subtotal Support Costs			**0.000**	**0.000**		**0.000**				**0.000**	**0.000**	**0.000**
Remarks:												
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**				**0.000**	**0.000**	**0.000**
Remarks:												
Contractor Engineering Support	Various	Other Contractors	9.668	0.000		0.000				0.000	9.668	0.000
Government Engineering Support	WR	NSWC CD Philadelphia, PA	3.763	0.000		0.000				0.000	3.763	0.000
Government Engineering Support	WR	NSWC Carderock, Md.	8.903	0.000		1.691	OCT-09			0.000	10.594	0.000
Government Engineering Support	Various	Other Gov't Activities	32.809	0.861	VAR	0.000				0.000	33.670	0.000
Subtotal Management Services			**55.143**	**0.861**		**1.691**				**0.000**	**57.695**	**0.000**
Remarks:												
Total Cost			**108.215**	**0.861**		**1.691**				**0.000**	**110.767**	**38.062**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPM**	PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**			PROJECT NUMBER AND NAME **2469/Open System Architecture (OSA)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Total Ship Open Zone Concept		1Q-3Q					
Total Ship Open Zone Architecture Development		3Q-4Q	1Q-3Q				
Total Ship Open Zone Interface Development			3Q-4Q				
Open C&C Zone Interfaces Implemented Cross-Platform	1Q-4Q	1Q					
Open Weapons Zone Interface Development	1Q-4Q	1Q-2Q					
Open Weapons Zone Interfaces Implemented		2Q-4Q	1Q-4Q				
Open Sensors Zone Concept	1Q-4Q						
Open Sensors Zone Architecture Development	4Q	1Q-4Q	1Q-3Q				
Open Sensors Zone Interface Development			3Q-4Q				
Open Machinery Zone Concept	1Q-4Q	1Q-4Q					
Open Machinery Zone Architecture Development		4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2470/ITD-Integrated Topside Design**		
COST (In Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Project Cost	0.401	0.011	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops the necessary technologies to achieve a total integrated topside design focused on DDG 1000 and other future surface combatant ships as well as supporting upgrades to existing ships in the Fleet. Technology focus areas include the development, enhancement, validation and verification of modeling and simulation (M&S) tools to support topside signature control, electronic warfare effectiveness, and electromagnetic engineering. This project also develops technical data to support the use of large-scale marine composites on surface combatants to facilitate topside signature control. Topside signature control and electronic warfare effectiveness M&S tools supported by this project enable Navy transformation efforts related to sea strike by facilitating the cost effective design, design approval, and Live Fire Test and Evaluation of low signature surface ships. The validated, integrated, physics-based, electromagnetic radiation (VIPER) M&S tool suite currently being developed under this project will provide the Navy with a state-of-the-art electromagnetic engineering (EME) capability that is applicable to both new construction and existing ships in the Fleet. By providing the design community with tools able to accurately predict the optimum arrangement of topside sensors to minimize electromagnetic interference (EMI), this project enables Navy transformation efforts by facilitating FORCEnet, the connection of sensors, networks, weapons, decision aids and warriors from seabed to space. Development of marine composite technical data supports Navy transformation efforts by enabling the cost effective design of stealthy surface ship topsides that have improved corrosion control which, in turn enables optimized manning. This program is directed toward improved affordability, performance, reduced life cycle cost, reliability and maintainability, signature reduction, standardization, and weight and manning reductions for the existing and future Fleet.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2470/ITD-Integrated Topside Design**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.401	0.011	0.000
RDT&E Articles Quantity	0	0	0

FY08: Started Ver 5.0 Advanced Antenna Design and Analysis (D&A) M&S Tool Development.

FY09: Conduct assessment of Topside modeling and simulation tools.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

Government Field Activities-Naval Research Laboratory, Washington DC, and
Space and Naval Warfare Systems Center, San Diego, Ca.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMENT**				PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Project Cost	5.534	3.115	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The FY 10 funding for Integrated Power Systems (IPS) is reflected in Program Element (PE) 0603573N.

This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system. IPS supports multiple ship class applications for future surface ships, with DDG 1000, DDG 1000 future flight upgrades, and CG(X) being the primary ship application target. On 6 January 2000, SECNAV announced Navy intent that DDG 1000 be an electric drive ship with integrated power architecture. IPS reduces acquisition and operating costs of naval ships and increases military effectiveness. IPS leverages investments in technologies that will be useable by both military and commercial sectors.

- (U) IPS has the potential to revolutionize the design, construction, and operation of U.S. naval ships by using electricity as the primary energy transfer medium aboard ship. The flexibility of electric power transmission allows power generating modules with various power ratings to be connected to propulsion loads and ship service in any arrangement that supports the ship's mission at lowest overall cost. Systems engineering in IPS is focused on increasing the commonality of components used across ship types and in developing modules which will be integral to standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.
- (U) IPS addresses ship platform program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads; improved ship survivability and reduced vulnerability through increased arrangement flexibility and improved electrical system survivability; reduced manning through improved power management systems and reduced on-board maintenance requirements; improved ship signature characteristics; improved design adaptability to meet future requirements of multiple ship types or missions; integrating power management and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load management functions; simplified technology insertion which allows new technologies to be installed within IPS much less expensively than presently possible; and, reduced machinery system acquisition costs through utilization of commercially shared technologies and components.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	3.250	1.114	0.000
RDT&E Articles Quantity	0	0	0

System Development: Completed prototype of detailed design and manufacture of high-speed generator. Commence preliminary and detailed design of power conversion equipment for advanced architecture.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.134	1.926	0.000
RDT&E Articles Quantity	0	0	0

System Test: Completed Land Based Test Site modifications for High Speed Generator (HSG). Conduct testing of the HSG at the land based test site at NSWCCD, Philadelphia PA.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.150	0.075	0.000
RDT&E Articles Quantity	0	0	0

Platform Specific: Developed IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including concepts of operations, system level descriptions/requirements, and module performance specifications as necessary to support power system requirements for CG(X) and other future ships.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

IPS is a candidate system for DDG 1000 and all other future surface ships.

E. MAJOR PERFORMERS:

IPS DDG 1000 Design Agent, Ingalls Shipbuilding, General Atomics and DRS Power and Controls Technologies Inc., IPS IFTP contractors. Curtiss Wright, High Speed Generator contractor. Northrop-Grumman Electronic Systems, power electronics contractor.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	**9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
2858A MTTC/IPI and National Surface Treatment Center	3.094	0.000	0.000
RDT&E Articles Quantity	0	0	0

This Congressional add funded the continuous operation of the McConnell Technology and Training Center (MTTC/IPI) and the National Surface Treatment Center. This effort funds projects targeted at resolving fleet maintenance problems/issues through the rapid insertion of new technologies.

	FY 2008	FY 2009	FY 2010
9D30A Data Acquisition Reporting and Trending System (DARTS)	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0

The Data Acquisition Reporting and Trending System (DARTS) is an acquisition application which provides log sheet capabilities. This add will enhance and integrate parts of DARTS functionality into both legacy and new Condition Based Maintenance (CBM) applications, where applicable.

	FY 2008	FY 2009	FY 2010
9D25A/DDG-51 Hybrid Drive System	0.000	6.581	0.000
RDT&E Articles Quantity	0	0	0

Funds for the DDG51 Hybrid Drive System are used to develop, build, and test proof of concept equipment for a DDG-51 Hybrid Electric Drive System. Development of this technology significantly reduces fuel consumption and increased DDG51 Class mission effectiveness through longer time on station.

	FY 2008	FY 2009	FY 2010
9D26A Mobile Valve and Flex Hose Maintenance (MVFM)	0.000	0.997	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to improve the current process of inspecting valves and flex hoses on-board ship from a cumbersome and manpower intensive effort to one that provides ships force and repair activities with one source for Valve and Flex Hose configurations. When fully implemented and operational the MVFM will save approximately 8-10% of typical ship availability. Without MVFM, Shipboard PMS and Quality of Life for the sailor is severely reduced due to time constraints and lack of available personnel to accomplish PMS.

	FY 2008	FY 2009	FY 2010
9D27A Power Dense Integrated Power System for CG(X)	0.000	2.992	0.000
RDT&E Articles Quantity	0	0	0

Funds will continue the development of a power dense Integrated Power System (IPS) suitable for surface combatant main power generation, distribution and conversion. These funds will be used to perform a system level analysis of future electrical power needs and design and manufacture of prototype demonstration hardware.

	FY 2008	FY 2009	FY 2010
9D29A Extreme Torque (XTM) Propulsion Motor	0.000	0.798	0.000
RDT&E Articles Quantity	0	0	0

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	**9999/CONGRESSIONAL ADDS**	

Funds will continue design and development of Full Scale Extreme Torque Density (XTM) Propulsion Motor technology for future Naval vessels. More power dense, efficient, and reduced noise signature propulsion systems may be necessary to meet evolving requirements for future combatants.

	FY 2008	FY 2009	FY 2010
9D31A Infrared LED Free Space Optics Communications Advancement	0.000	0.399	0.000
RDT&E Articles Quantity	0	0	0

Funds used to securely communicate using infrared light, enabling simultaneous data, video and voice communication in environments, where otherwise communication would be impossible or undesirable. Navy, through appropriate work scope definition and coordination with NAVSEA technical authority and operational users, will develop effective Infrared LED Free Space Optics in support of Navy secure communications concepts.

	FY 2008	FY 2009	FY 2010
9D32A Landing Craft Composite Lift Fan	0.000	0.997	0.000
RDT&E Articles Quantity	0	0	0

Funds used to support the design, development and manufacture of two sets of prototype composite material lift fans for application on current and next generation Navy landing craft vessels. The initiative will address an ongoing problem the Navy has been experiencing with current generation metal lift fan blades that have to be replaced every few months at a cost of approximately $1.4M a year. This technology will extend the life of landing craft lift fans, reducing failures, maintenance, and life cycle costs.

	FY 2008	FY 2009	FY 2010
9972A Advanced Fluid Controls for Shipboard Applications	2.326	2.493	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Fluid Controls for Shipboard Applications, develops materials, including composites and ceramics, for a variety of fluid control solutions that focused on providing intelligent control and interface directly with the ship's main computer.

	FY 2008	FY 2009	FY 2010
9973A Advanced Repair Technology for Expeditionary Navy	0.771	0.798	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Repair Technology for Expeditionary Navy focuses on providing innovations in repair technology to the Expeditionary Navy aboard ships at sea and at forward repair sites.

	FY 2008	FY 2009	FY 2010
9974A Advanced Steam Turbine	3.855	1.596	0.000
RDT&E Articles Quantity	0	0	0

The Advanced Steam Turbine, develops advanced technologies that resulted in a quieter, smaller turbine generator for the US Navy.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9975A Air Gun Shock Testing of Naval Vessels	1.549	0.000	0.000
RDT&E Articles Quantity	0	0	0

The Air Gun Shock Testing of Naval Vessels develops a low cost, environmentally safe underwater shock testing method employing non-explosive energy sources suitable for shock testing the ship or shock qualifying major shipboard systems.

	FY 2008	FY 2009	FY 2010
9980A High Efficiency Quiet Electric Drive	1.552	0.000	0.000
RDT&E Articles Quantity	0	0	0

High Efficiency Quiet Electric Drive develops and demonstrates an advanced propulsion motor drive by utilizing a hybrid power electronics approach.

	FY 2008	FY 2009	FY 2010
9981A Integrated Power System Converter	0.776	1.995	0.000
RDT&E Articles Quantity	0	0	0

Integrated Power System Converter develops integrated power system propulsion motor drive power electronics technologies for future surface combatants that allows for rapid response to electrical system load demands.

	FY 2008	FY 2009	FY 2010
9982A Propulsor Manufacturing Technology Development	2.324	0.000	0.000
RDT&E Articles Quantity	0	0	0

Propulsor Manufacturing Technology Development develops coatings for propellers to improve erosion resistance, fouling resistance and efficiency characteristics.

	FY 2008	FY 2009	FY 2010
9983A Smart Valve	2.326	0.798	0.000
RDT&E Articles Quantity	0	0	0

Smart Valve develops linear electromechanical actuator technology to help eliminate high pressure hydraulic and pneumatic systems in a shipboard environment.

	FY 2008	FY 2009	FY 2010
9B60A Advanced Navy Boat Lift Research and Development	0.970	0.000	0.000
RDT&E Articles Quantity	0	0	0

Advanced Navy Boat Lift Research and Development funds an effort so that many boats, including larger force protection boats and maritime expeditionary security force boats, do not sit in corrosive marine environments increasing the maintenance requirements on the hull and propulsion systems. The ability to remove a boat from this environment without hauling onto a terrestrial trailer or maintenance cradle is vital to minimize these maintenance requirements and allows hull and propulsion system work to be performed over the water. The use of boat lifts improves the boat's performance, also saves time, fuel and money, while prolonging the life of the boats.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9B61A Circuit Breaker for Navy Shipboard Power Distribution Center	0.582	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for Circuit Breakers for Navy Shipboard Power Distribution Center are used for the development of a militarized version of a commercial off the shelf direct current (DC) circuit breaker rated at 800 amp/650 VDC in shock isolation mounted electrical assemblies for Naval ship low voltage power system applications.

	FY 2008	FY 2009	FY 2010
9B62A DDG-51 Homopolar Hybrid Drive	5.320	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the DDG 51 Homopolar Hybrid Drive are used to develop, build, and test proof of concept equipment for a hybrid electric drive system. Development of this technology significantly reduces fuel consumption and increases DDG 51 Class mission effectiveness through longer time on station.

	FY 2008	FY 2009	FY 2010
9B63A High Temperature Superconductor AC Synchronous Propulsion Motor	1.940	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the High Temperature Superconducting AC Synchronous Motor are used for the continued testing of the high temperature superconducting motor to support full power testing of the prototype motor as well as completed preliminary design for militarization of the HTS-AC motor and associated drive system for potential application to a future surface combatant.

	FY 2008	FY 2009	FY 2010
9B64A High Temperature Superconductor (HTS) Navy propulsion Motor/DDG1000	1.940	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the High Temperature Superconductor (HTS) Navy propulsion Motor for DDG-1000 are used for the continued testing of the high temperature superconducting motor up to full power.

	FY 2008	FY 2009	FY 2010
9B65A Internet Protocol over Power Line Carrier Tech Integration w/ ICAS	1.562	0.000	0.000
RDT&E Articles Quantity	0	0	0

Internet Protocol over Power Line Carrier Technology (ICAS) is funded to develop a high bandwidth PLC (Power Line Communication) FIPS 140-2 certified IP over power line product, which served to enable and support further development and enhancement of the current PLC technology for Navy applications.

	FY 2008	FY 2009	FY 2010
9B66A Naval Flywheel Energy Storage System	0.582	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for Naval Flywheel Energy Storage System are used to develop and test a flywheel energy storage system with greater power density and output that is fully adapted to the shipboard environment.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603513N/SHIPBOARD SYSTEM COMPONENT DEVELOPMEN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

	FY 2008	FY 2009	FY 2010
9B67A Power Conversion Equipment for High Density Power Generation	0.775	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds for the Power Conversion Equipment for High Density Power are used to develop proof of concept power conversion equipment for an advanced high density power generation system.

	FY 2008	FY 2009	FY 2010
9B68A Shipboard Wireless Maintenance Assistant (SWMA)	1.163	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding for Shipboard Wireless Maintenance Assistant (SWMA) is used for development of mobile, hand-held information technology and technical tools for shipboard maintenance personnel. The handheld computing device supports wired or wireless networking, enabled technical data access, and display and collaborative resource sharing through live video, audio capability, and diagnostic tools and modules.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603542N/RADIOLOGICAL CONTROL**					
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	2.666	1.090	1.372				
1830 / RADIAC DEVELOPMENT	2.666	1.090	1.372				

A. MISSION DESCRIPTION:

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10CFR). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war involving radiological or nuclear materials in order to enable continuity of warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency improvement. In all cases a technology refresh will make both economic sense and provide increased operational capabilities. Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities. Non-NNPP: Instruments are developed to support other than NNPP end users, such as Explosive Ordnance Disposal, Weapons, Medical, Industrial Radiography and Training. Expanded Maritime Intercept Operations (EMIO): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated. The AN/PDR-65 Ship Board Monitoring System is obsolescent and will be replaced. The IM-239/WDQ Air Particle Detector (APD) and the HD-732, HD-1150 and HD-1151 Air Particle Samplers (APS) are obsolescent and will be replaced.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603542N/RADIOLOGICAL CONTROL**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	1.522	1.094	0.891
FY10 President's Budget	2.666	1.090	1.372
Total Adjustments	1.144	-0.004	0.481
(U) Summary of Adjustments			
Secure Data Sharing for Digital Radiographic	1.192	0.000	0.000
Rate/Misc Adjustments	-0.048	-0.004	-0.019
Program Adjustments	0.000	0.000	0.500
Total	1.144	-0.004	0.481

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010					To Complete	Total Cost
OPN BLI 292000 RADIAC	10.121	9.811	5.990					CONT	CONT

D. ACQUISITION STRATEGY:

Development efforts are being focused on evaluation, modification (as required to meet operational requirements) and adaptation of commercial-off-the-shelf (COTS) technology in order to minimize total ownership costs. To the maximum extent possible new contracts are targeted for fixed price efforts to control development cost.

E. MAJOR PERFORMERS:

NSWC Carderock. Science & Technology Agent, Technical Direction Agent and Primary Contracting Officer.

Orbis, Inc. In Service Engineering Agent (ISEA) services.

DoE Remote Sensing Laboratory. Development of Next Generation Air Particle Detector (IM-239/WDQ).

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**				PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	2.666	1.090	1.372				
RDT&E Articles Qty	51	12	13				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10CFR). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war that involves nuclear material in order to enable continuing warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency improvement. In all cases a technology refresh will make both economic sense and provide increased operational capabilities. Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities. Non-NNPP: Instruments are developed to support other than NNPP end users, such as Explosive Ordnance Disposal, Weapons, Medical, Industrial Radiography and Training. Expanded Maritime Intercept Operations (EMIO): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated. The AN/PDR-65 Ship Board Monitoring System is obsolescent and will be replaced. The IM-239/WDQ Air Particle Detector (APD) and the HD-732, HD-1150 and HD-1151 Air Particle Samplers (APS) are obsolescent and will be replaced.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**	PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Digital Radiographic Imaging	1.157	0.000	0.000
RDT&E Articles Quantity	0	0	0
Congressional Add for Digital Radiographic Imaging project at University of Washington.			
	FY 2008	FY 2009	FY 2010
VBSS	0.206	0.000	0.000
RDT&E Articles Quantity	35	0	0
Complete testing of equipment for Vessel Boarding Search and Seizure (VBSS) mission. Articles are prototypes for evaluation.			
	FY 2008	FY 2009	FY 2010
Training RADIAC	0.241	0.000	0.000
RDT&E Articles Quantity	6	0	0
Complete in FY08 Multi-Function RADIAC (MFR) Training Simulators for NNPP.			
	FY 2008	FY 2009	FY 2010
NNPP Survey Meter	0.212	0.340	0.000
RDT&E Articles Quantity	10	10	0
Develop and test calibration software, survey instruments, dosimeters and associated probes for non-Naval Nuclear Propulsion Program (NNPP) end uses, to include Explosive Ordnance Disposal (EOD) and Radiological and Nuclear Defense (RND). Develop Next Generation non-NNPP Survey Meter. Articles are prototypes for evaluation.			
	FY 2008	FY 2009	FY 2010
IM-239/WDQ	0.850	0.750	0.750
RDT&E Articles Quantity	0	2	2
Air Particle Detector (APD) development. Articles are prototypes for test and evaluation.			
	FY 2008	FY 2009	FY 2010
Pressurized Ion Chamber	0.000	0.000	0.090
RDT&E Articles Quantity	0	0	6
The Radiological Affairs Support Office (RASO) has asked for a feasibility study into the performance of a pressurized ion chamber in a pulsed X-ray field. To answer RASO, NSWCCD must research the various pressurized ion chambers and evaluate each based on requirements. Articles are prototypes for evaluation.			
	FY 2008	FY 2009	FY 2010
USNA Intern	0.000	0.000	0.015
RDT&E Articles Quantity	0	0	0
Support US Naval Academy Midshipman summer internship in study of Naval Dosimetry System.			

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**	PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**	

	FY 2008	FY 2009	FY 2010
EPD Mesh Network	0.000	0.000	0.467
RDT&E Articles Quantity	0	0	5

Naval Reactors has requested the study of adding capabilities to the newly fielded Electronic Pocket Dosimeter (EPD). Besides its basic functionality for recording dose exposure, this instrument also has the ability to remotely monitor and report the radiation exposure of on-scene emergency responders. This feature has not been implemented in Navy, but the USAF already makes extensive use of the same EPD, along with the extra hardware and software required for the purpose of keeping track of responders in emergencies in terms both of their accumulated exposure and precise location.

A second application of the EPD telemetry capability is for radiological work. This could include both workers wearing EPDs during high radiation level work, and EPDs being posted at locations where radiation level measurements are required in high radiation background areas. Posting of EPDs in such a situation would preclude having a technician enter the area with a RADIAC meter to measure the radiation level. An example would be monitoring the radiation level of the pipe through which primary plant resin is being discharged from the ship.

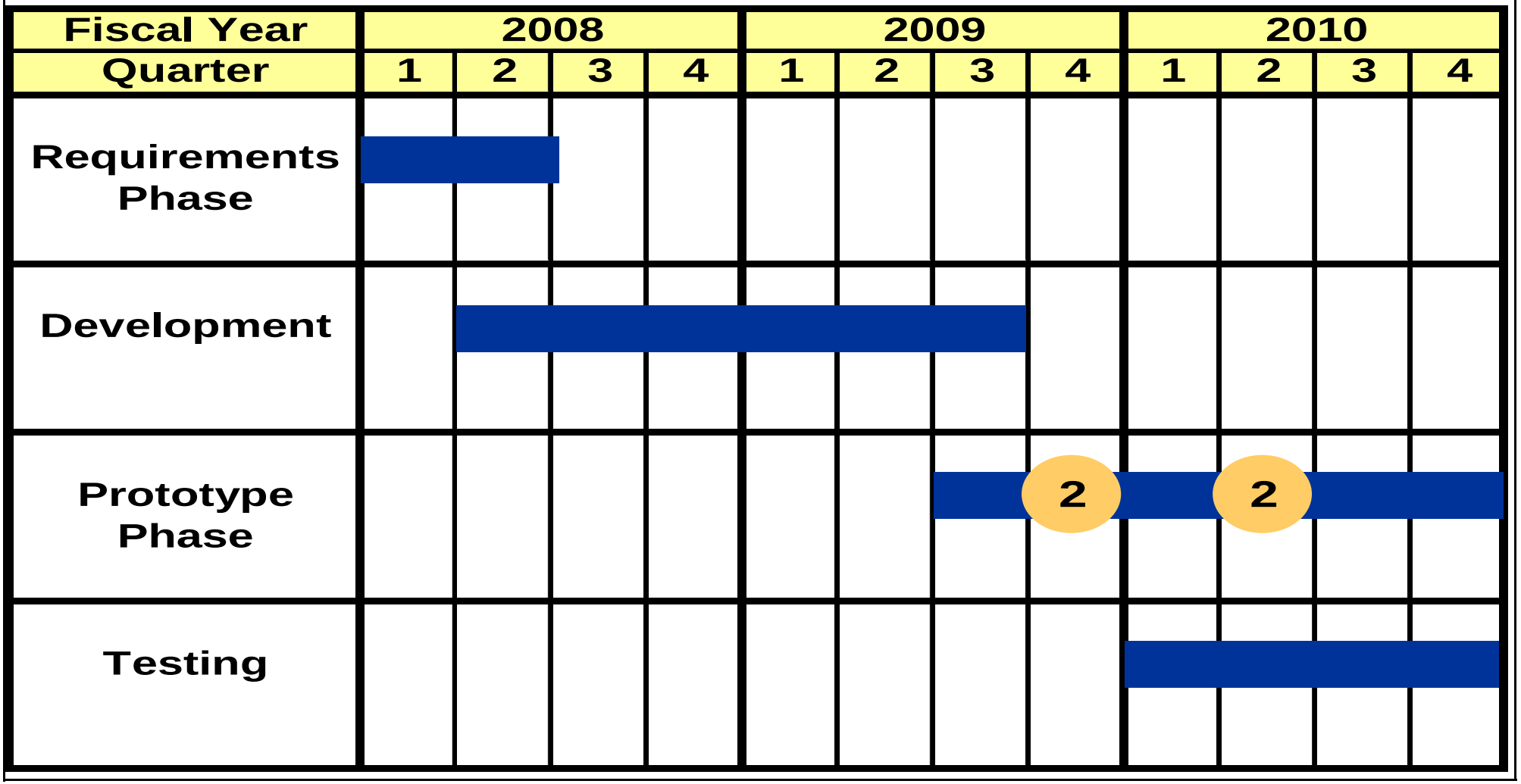
Articles are the COTS hardware and software for evaluation and testing at shipyards and nuclear maintenance facilities.

	FY 2008	FY 2009	FY 2010
Optically Stimulated Luminescence (OSL)	0.000	0.000	0.050
RDT&E Articles Quantity	0	0	0

The need for dosimetry is inherent to ionizing radiation. The infrastructure established by the Navy for its dosimetry is extensive. New dosimetry technologies must be researched well in advance to determine significance of performance, cost to field and cost to maintain. OSL is a relatively new technology and its benefits have not yet been fully determined. If OSL is not researched and the benefits not determined, the Navy may not be able to keep the precise records and safety standards that are required for personnel dosimetry. The Navy has the potential to utilize a better means of monitoring personnel exposure.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**			PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**					
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	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Primary Hardware Development	C/FP	Various	11.218	0.000		0.000				
Subtotal Product Development			**11.218**	**0.000**		**0.000**				
Remarks:										
Development Support	WX	NSWC Carderock	3.054	0.130	JAN-09	0.270	NOV-09			
Development Support	Contract	Univ. of Washington	0.000	0.000		0.000				
Subtotal Support Costs			**3.054**	**0.130**		**0.270**				
Remarks:										
Operational Test & Evaluation	WX	Various	0.638	0.100	MAR-09	0.132	FEB-10			
Subtotal Test and Evaluation			**0.638**	**0.100**		**0.132**				
Remarks:										
Contractor Engineering Support	C/FP	Orbis, Inc., Charleston, SC	1.769	0.100	MAY-09	0.210	NOV-09			
Labor (Research Personnel)	IPR	DoE, RSL, Nellis AFB, NV	1.313	0.750	JAN-09	0.750	NOV-09			
Travel	PD	NAVSEA	0.375	0.010	APR-09	0.010	NOV-09			
Subtotal Management Services			**3.457**	**0.860**		**0.970**				
Remarks:										
Total Cost			**18.367**	**1.090**		**1.372**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**	PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603542N/RADIOLOGICAL CONTROL**			PROJECT NUMBER AND NAME **1830/RADIAC DEVELOPMENT**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Prototypes		Q4	Q2				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION				DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603553N/SURFACE ASW**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	45.671	48.189	21.995				
1704 / Undersea Warfare	24.802	29.440	21.995				
9999 / CONGRESSIONAL ADDS	20.869	18.749	0.000				

A. MISSION DESCRIPTION:

The Anti-Submarine Warfare (ASW) Advanced Development project provides advanced development demonstration and validation of technology for potential surface sonar and combat system applications. Program Element (PE) 0603553N has been designated to support emerging multi-static technologies, and the CNO's ASW Initiative. Efforts focus on resolution of technical issues associated with providing capability against the FY08 and beyond threat, with emphasis on shallow water/littoral areas, deep water Undersea Warfare (USW), and demonstration and validation of USW concepts and technology. Key technology areas include active sonar transmissions; advanced signal and data processing; active sonar classification; towed and hull arrays; transducer technology; and periscope detection techniques. Starting in FY07, the CNO ASW Initiative (formerly known as Task Force ASW) included the development of new and innovative technologies. Efforts associated with these technologies include design, development, integration, and testing of future undersea superiority systems. These systems include distributed sensor systems; Vertical Line Array; static active buoy field; submarine countermeasures; compact rapid effect weapon; longer range radio system; multi-static sonar; and multi-sensor data fusion, including multi-platform data fusion and net-centric USW concepts.

Project Unit 9999 is comprised of Congressional Adds for Improved Surface Vessel Torpedo Launcher (FY08), and Small Business Technology Insertion (FY08 & FY09) and Automated Readiness Measurement Systems (FY09).

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	46.475	29.574	36.399
FY10 President's Budget	45.671	48.189	21.995
Total Adjustments	-0.804	18.615	-14.404
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	-0.131	0.000
SBIR/STTR/FTT Assessment	-0.804	0.000	0.000
Program Adjustments	0.000	18.800	-14.013
Rate/Misc Adjustments	0.000	-0.054	-0.391
Total	-0.804	18.615	-14.404

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

E. MAJOR PERFORMERS:
- Naval Undersea Warfare Center (NUWC), Newport, RI
- Space and Naval Warfare Systems Center (SPAWARSYSCEN), San Diego, CA
- Johns Hopkins University/Applied Physics Laboratory (JHU/APL), Laurel, MD
- University of Texas/Applied Research Laboratories (UT/ARL), Austin, TX
- 3-Phoenix Incorporated, Fairfax, VA
- Alion Sciences, Groton, CT
- Lockheed Martin, San Diego, CA

All performers support technology evaluations and demonstrations for superiority initiatives.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**				PROJECT NUMBER AND NAME **1704/Undersea Warfare**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	24.802	29.440	21.995				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The CNO's ASW initiative is a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. The CNO's ASW initiative will coordinate the development of technologies which move beyond incremental or marginal improvements in ASW effectiveness. The CNO's vision of "fundamentally changing the way ASW is currently conducted to render the enemy submarine irrelevant against U.S. and coalition forces", necessitates a change in the calculus of how the US Navy conducts ASW. Central to CNO's ASW initiatives achieving the CNO's vision are several innovative approaches which include using the art-of-the-technologically-possible; minimizing force-on-force; reducing the ASW end-to-end time line; supporting rapid maneuver; developing off-board and distributed ASW detection systems; and finding innovative weapons solutions. To achieve these key approaches, it is essential to develop new ASW technologies and conduct at-sea experiments to prove/disprove technology concepts and collect corroborating data. The most promising technology concepts from government laboratories, university research centers, and industry are developed to the point where these technologies can be tested in at-sea experiments, with the objective of transitioning those which demonstrate exceptional capability to programs of record.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**	PROJECT NUMBER AND NAME **1704/Undersea Warfare**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
CNO ASW Initiative	24.802	29.440	21.995
RDT&E Articles Quantity	0	0	0

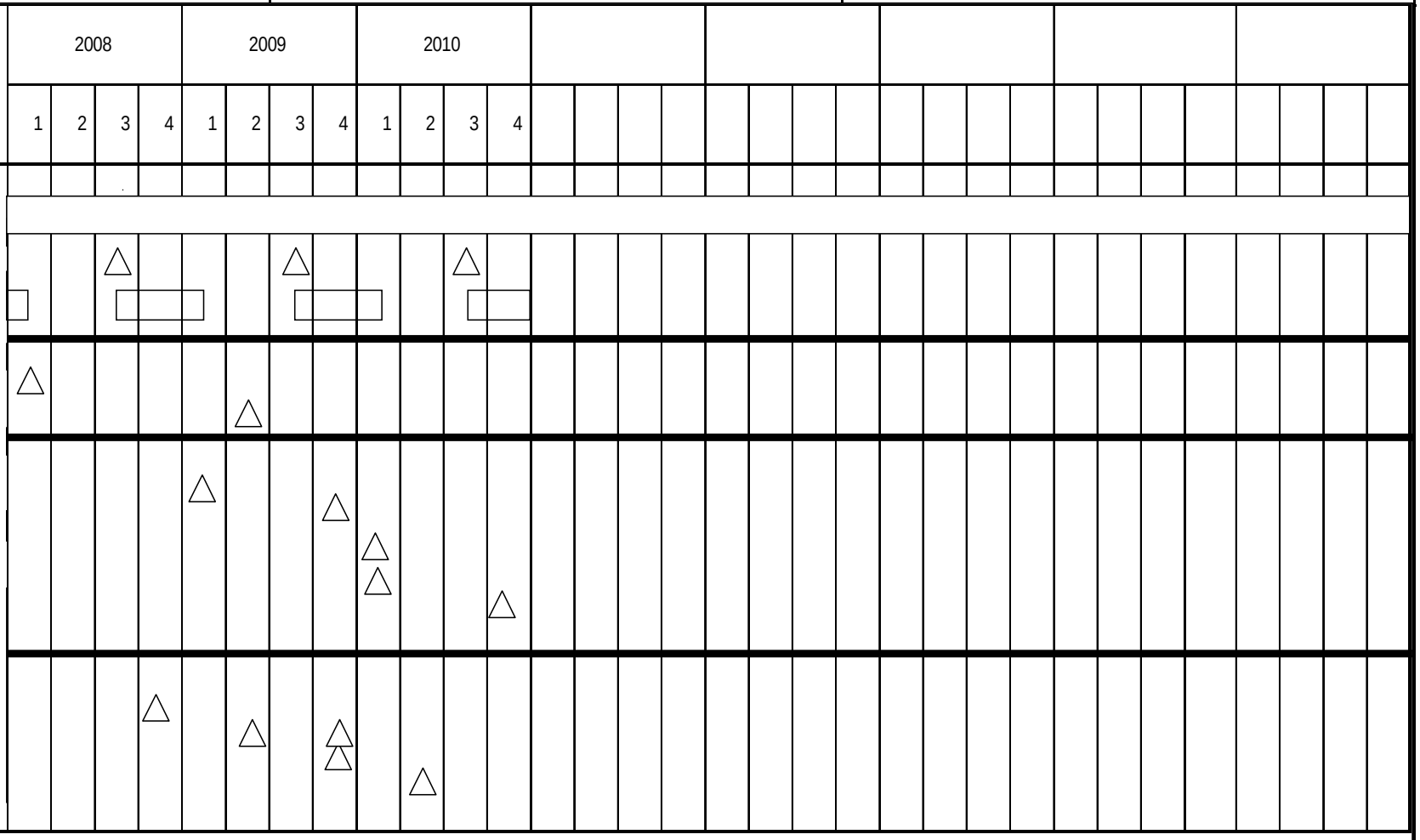
FY08 Accomplishments - Successfully conducted Factory Acceptance Testing and over-the-water performance testing on the Advanced Development Model for Periscope Detection Radar (PDR). Developed and delivered False Alarm Reduction Algorithms based on successful Valiant Shield 07 and commenced preparations for a late 3Q at-sea experiment.

FY09-10 plans include continued development and procurement of specific innovative technologies, such as active sonar clutter reduction, continuous active sonar, and development of new acoustic, non-acoustic, and off-board sensors (including contributions to Reliable Acoustic Path (RAP) Vertical Line Array (VLA) and Deep Water Active Detection System (DWADS)); procurement of reusable test assets for specific technology concepts; continued investment in developing and testing the highest potential technology concepts through the establishment of a spiral development process for surface sonar; initiation of a Fleet Synthetic Training (FST) capability for surface ASW; and conducting independent critical review and analysis of alternatives of selected and potential CNO ASW initiative technologies .

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**				PROJECT NUMBER AND NAME **1704/Undersea Warfare**						
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
Multi-Static Sonar Development	WR	NUWC/Newport, RI	1.524			0.000		0.000			1.524	0.000
Multi-Static Sonar Development	C/CPFF	AAC, NY	0.067			0.000		0.000			0.067	0.000
Multi-Static Sonar Development	WR	NAWC/Patuxent River, MD	0.230			0.000		0.000			0.230	0.000
Multi-Static Sonar Development	C/CPFF	Adaptive Methods, VA	1.003			0.000		0.000			1.003	0.000
Multi-Static Sonar Development	C/CPFF	JHU/APL, MD	0.017			0.000		0.000			0.017	0.000
Multi-Static Sonar Development	WR	SPAWAR/San Diego, CA	0.541			0.000		0.000			0.541	0.000
Subtotal Product Development			**3.382**			**0.000**		**0.000**			**3.382**	**0.000**
Remarks:												
Subtotal Support Costs			**0.000**			**0.000**		**0.000**			**0.000**	**0.000**
Remarks:												
Developmental Test & Evaluation	WR	NUWC/Newport, RI	3.472			0.000		0.000			3.472	0.000
Developmental Test & Evaluation	WR	NAWC/Patuxent River, MD	0.343			0.000		0.000			0.343	0.000
Developmental Test & Evaluation	C/CPFF	BBN, VA	0.250			0.000		0.000			0.250	0.000
Developmental Test & Evaluation	C/CPFF	AAC, NY	1.067			0.000		0.000			1.067	0.000
Developmental Test & Evaluation	WR	NUWC/Keyport, WA	0.519			0.000		0.000			0.519	0.000
Developmental Test & Evaluation	WR	NSWC/Dahlgren, VA	0.365			0.000		0.000			0.365	0.000
Developmental Test & Evaluation	C/CPFF	UT/ARL, TX	3.844			0.000		0.000			3.844	0.000
Developmental Test & Evaluation	C/CPFF	Progeny, Inc., VA	0.000			0.000		0.000			0.000	0.000
Developmental Test & Evaluation	MIPR	U.S. ARMY/MITRE, MA	0.260			0.000		0.000			0.260	0.000
Developmental Test & Evaluation	WR	NRL, DC	1.042			0.000		0.000			1.042	0.000
Developmental Test & Evaluation	WR	NSWC/Carderock, MD	1.344			0.000		0.000			1.344	0.000
Developmental Test & Evaluation	WR	NSMA, VA	1.907			0.000		0.000			1.907	0.000
Subtotal Test and Evaluation			**14.413**			**0.000**		**0.000**			**14.413**	**0.000**
Remarks:												
Program Management Support	C/CPAF	BAE SYSTEMS, MD	1.586			0.950	DEC-08	0.950	NOV-09		3.486	0.000
Program Management Support	C/CPFF	Stanley and Associates, VA	0.350			0.000		0.000			0.350	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**				PROJECT NUMBER AND NAME **1704/Undersea Warfare**						
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
Travel	WR	NAVSEA PEO IWS 5, DC	0.150			0.050	OCT-08	0.050	OCT-09		0.250	0.000
Subtotal Management Services			**2.086**			**1.000**		**1.000**			**4.086**	**0.000**
Remarks:												
Technology Development	C/CPFF	JHU/APL, MD	18.133			9.200	DEC-08	7.500	DEC-09		34.833	0.000
Technology Development	WR	NUWC/Newport, RI	19.540			7.000	OCT-08	5.936	OCT-09		32.476	0.000
At-Sea Test/Experiment	WR	ONR/Alion Sciences, VA	0.000			0.000		0.000			0.000	0.000
At-Sea Test/Experiment	WR	ONR/3 Phoenix, VA	7.989			0.000		0.000			7.989	0.000
Enhanced Data Collection (SSEMP)	C/CPFF	JHU/APL, MD	4.462			0.000		0.000			4.462	0.000
Enhanced Data Collection (SSEMP)	C/CPFF	UT/ARL, TX	2.000			0.000		0.000			2.000	0.000
Technology Development	C/CPFF	Northrop Grumman Corp., VA	5.284			0.000		0.000			5.284	0.000
Technology Development	C/CPFF	Adaptive Methods, VA	1.085			0.000		0.000			1.085	0.000
Technology Development	C/CPFF	AAC, NY	1.067			0.000		0.000			1.067	0.000
Technology Development	C/CPFF	Alion Sciences, VA	0.000			2.500	DEC-08	2.000	DEC-09		4.500	0.000
Technology Development	C/CPFF	Lockheed Martin, ISS	0.000			5.334	DEC-08	2.000	DEC-09		7.334	0.000
Technology Development	C/CPFF	UT/ARL, TX	0.000			3.400	DEC-08	2.699	DEC-09		6.099	0.000
Technology Development	WR	NUWC/Keyport, WA	0.000			0.126	OCT-08	0.260	OCT-09		0.386	0.000
Technology Development	WR	NSWC/Carderock, MD	0.000			0.680	OCT-08	0.400	OCT-09		1.080	0.000
Technology Development	MIPR	U.S. ARMY/MITRE, MA	0.000			0.200	NOV-08	0.200	NOV-09		0.400	0.000
Subtotal AT-SEA TEST			**59.560**			**28.440**		**20.995**			**108.995**	**0.000**
Remarks:												
Total Cost			**79.441**			**29.440**		**21.995**			**130.876**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**	PROJECT NUMBER AND NAME **1704/Undersea Warfare**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**			PROJECT NUMBER AND NAME **1704/Undersea Warfare**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
CNO ASW Initiative:							
Technology Development	1Q-4Q	1Q-4Q	1Q-4Q				
Conduct At-Sea Experiment (Test promising technologies)	3Q	3Q	3Q				
Analyze Experimental Data	1Q 3Q-4Q	1Q 3Q-4Q	1Q 3Q-4Q				
Periscope Detection Radar Program:							
Over Water Test	1Q						
ADM Install on CVN-73		2Q					
Active Sonar Clutter Reduction Program:							
Valiant Shield 08		1Q					
Algorithm Delivery to AN/SQQ-89A(V)15		4Q					
Algorithm Delivery to DAWDS			1Q				
Valiant Shield 09			1Q				
Algorithm Delivery to AN/SQQ-89A(v)15			4Q				
Continuous Active Sonar (CAS) Program:							
MF CAS Sea Test	4Q						
CAS 2087 Sea Test		2Q, 4Q					
CAS MF Assessment		4Q					
VDS CAS Sea Test			2Q				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603553N/SURFACE ASW**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9185A / Improved Surface Vessel Torpedo Launcher	1.590	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to support technology insertion initiatives associated with the Surface Vessel Torpedo Tube (SVTT) MK 32 Program. These efforts will help support the Navy's surface ship platform needs and will focus specifically on the development of Advanced Surface Launcher (ASL) prototypes to production levels and completion of launcher testing. This investment will be used to upgrade the current single-mission launcher to a multi-mission launcher (ASL), resulting in the following: increase in war fighting capability; increase in operational readiness; improved personnel safety; and reduced life cycle costs on both existing and future ships.

	FY 2008	FY 2009	FY 2010
9809A / Automated Readiness Measurement System	0.000	2.792	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to develop a readiness assessment tool which will be fully integrated into the Undersea Warfare Decision Support System (USW-DSS) Build 3 and subsequent builds with a scalable, extensible, open Commercial Off The Shelf (COTS) architecture compliant with the Common Surface Combatant Open Architecture (OA). ARMS will provide an objective assessment of readiness in multiple mission areas. The initial application will assess ASW mission areas and is being developed as a segment of USW-DSS. ARMS will provide a core application for the objective assessment of mission readiness, capable of dynamically configuring to ship class specific environments and systems. The ARMS tactical decision tool will provide the Commander with the ability to evaluate alternative force deployment and assignments, considering own force material and operational readiness, in a dynamic tactical environment. ARMS total ownership costs will be minimized by developing a functional architecture that is compliant with OA initiatives, scalable and extensible, and maximizes reuse of functionality across multiple ship classes.

	FY 2008	FY 2009	FY 2010
9B69A / Small Business Technology Insertion	19.279	15.957	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to implement the cost-effective advantages gained through the Acoustic Rapid Commercial Off-The-Shelf Insertion/Advanced Processor Build Program (ARCI/APB) within the submarine community concept in other acquisition programs. Cost effective gains include modularity, rapid technology insertion, software re-use, improved manufacturing processes, and cost reductions. Navy Open Architecture (OA) doctrine calls for a standard-based, middleware solution to be used for data communication. Funds will be used to encourage the use of virtualization that will allow disparate systems to co-exist on a single computer, thus allowing shipboard computer rooms/processing centers to be smaller in size, consume less power, and provide more processing capability in a more efficient and effective way.

CLASSIFICATION:	UNCLASSIFIED					
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			
COST (In Millions)	FY 2008	FY 2009	Baseline FY 2010	OCO FY 2010	TOTAL FY 2010	
Total PE Cost	152.499	150.686	551.836	9.000	560.836	
0223 / Sub Combat System Improvement (ADV)	51.551	46.824	52.697	0.000	52.697	
2033 / Adv Submarine System Development	80.719	57.390	74.408	9.000	83.408	
3197 / Undersea Superiority	0.000	36.818	37.214	0.000	37.214	
3220 / SBSD Advanced Submarine System Development	0.000	0.000	387.517	0.000	387.517	
9999 / Congressional Add	20.229	9.654	0.000	0.000	0.000	

A. MISSION DESCRIPTION:

This program element supports innovative research and development in submarine hull and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Industry Research and Development, and Small Business Innovative Research (SBIR) projects.

Project Unit 0223:

The Advanced Submarine Combat Systems Development non-acquisition (NON-ACAT) program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives through the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy Technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be Advanced Processing Build-Acoustic (APB-A), Advanced Processing Build-Tactical (APB-T), Advanced Processing Build - Imaging (APB-I), tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental tests related to specific platform applications.

Project Unit 2033:

The Advanced Submarine Research and Development (R&D) Program is a non-acquisition program that develops, matures, and transitions Hull, Mechanical, and Electrical (HM&E) technologies from Science & Technology (S&T) to operational platforms, develops, and demonstrates submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique R&D experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, capability, and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reductions and influence future submarine concepts and core

technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the Undersea Enterprise (USE), the Naval Network/FORCENET (NNFE), Naval Expeditionary Combat Enterprise (NECE), Surface Warfare Enterprise (SWE), and Special Operations Force Enterprise (SOFE). In addition to enterprise support, experimentation may identify, develop, integrate, and test Intelligence, Surveillance, and Reconnaissance (ISR) technologies and develop littoral precision strike capabilities that support the Overseas Contingency Operations (OCO). Experimentation and demonstration is conducted in a joint warfighting context with other services,(i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and joint project arrangements with the United Kingdom, Canada, and Australia.

Project Unit 2033 (OCO):
The project Scan Eagle operations from an SSGN intends to provide persistent, maritime and littoral network connectivity, surveillance and reconnaissance capabilities within localized mission areas. The Scan Eagle Unmanned Aerial Vehicle (UAV) is a multi-mission Intelligence, Surveillance, and Reconnaissance (ISR) system to support strike, signals intelligence, and communications relay while operating in direct collaboration with other deployed assets in OCO. The UAV will conduct localized open-ocean and littoral surveillance of targets as well as providing network connectivity for deployed unattended sensors. This UAV integration effort delivers launch, control, and recovery ability from a SSGN within an integrated joint ISR architecture, providing the information to the joint force and localized commanders in real time. This is a key role in providing the commander with a persistent, reliable picture of surface and ground threats while minimizing the need to put manned assets in harms way to execute surveillance and reconnaissance and Information Operation (IO) tasks.

Project Unit 3197:
The Undersea Superiority Project supports offboard Anti-Submarine Warfare (ASW) technologies selected by the Chief of Naval Operations (CNO) ASW Cross Functional Team for technologies that hold the potential for deployment and/or use by submarine platforms. Efforts associated with these technologies include design, development, integration and testing of future Undersea Superiority systems.

Project Unit 3220:
The objective of the Sea Based Strategic Deterrent (SBSD) Advanced Submarine System Development project is to design and prepare for construction of the replacement of the OHIO Class SSBN.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	149.576	141.720	152.854
FY10 President's Budget	152.499	150.686	560.836
Total Adjustments	2.923	8.966	407.982
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.003	-0.410	0.000
SBIR/STTR/FTT Assessment	-1.565	0.000	0.000
Program Adjustments	4.485	9.516	412.055
Rate/Misc Adjustments	0.000	-0.140	-13.073
OCO Funds	0.000	0.000	9.000
Total	2.923	8.966	407.982

The program adjustments shown in FY10 reflect the creation of a new Project Unit (3220) dedicated to the development of a new Sea Based Strategic Deterrent.

CLASSIFICATION:	UNCLASSIFIED			
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**
COST (In Millions)	FY 2008	FY 2009	FY 2010	
Project Cost	51.551	46.824	52.697	
RDT&E Articles Qty	0	0	0	

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project Unit 0223: The Advanced Submarine Combat Systems Development non-acquisition (Non-ACAT) program supports Navy Submarine Acoustic Superiority and Technology Insertion Initiatives by the application of advanced development and testing of sonar and tactical control systems improvements. This Project transitions technologies developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities, and DARPA. The Project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Specifically, the focus of the technology efforts will be Advanced Processing Build-Acoustic (APB-A), Advanced Processing Build-Tactical (APB-T), Advanced Processing Build - Imaging (APB-I), tactical control, and Advanced Sonar Arrays. APBs develop and demonstrate improvements to current and future sonar/combat control systems. The Advanced Sonar Arrays program develops and tests new sensors and demonstrates large array configuration. This Project is funded under demonstration and validation, as it develops and integrates hardware for experimental tests related to specific platform applications.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Advanced Sonar System Processing	24.187	27.484	28.097
RDT&E Articles Quantity	0	0	0

APB(A)-07 transitioned to PMS401 for fleet introduction. FY08 APB(A) continued improvements in medium and high frequency active systems, automated vulnerability detectors, improved tracking and localization and enhanced target acoustic state estimation. Efforts for FY09 through FY10 will focus on automating systems operations, in support of reduced workload and manning, while continuing efforts on improving the acoustic contribution to ASW in the littorals. Primary improvements are planned for the Wide Aperture Array (WAA), Low Cost Conformal Array (LCCA), and 688 Class sphere array signal processing, contact followers, trackers, refined automation, ranging tools, search space reduction tools, environmental prediction, and monitoring and active systems. Signal processing for a new fat-line towed array will be developed. Efforts will continue to focus on more seamless integration of acoustic and on non-acoustic sensor information for tracking and command information.

	FY 2008	FY 2009	FY 2010
Advanced Tactical Control	13.864	11.000	16.000
RDT&E Articles Quantity	0	0	0

APB(T)-07 transitioned to PMS425 for fleet introduction. FY08 APB(T) continued improvements in Command Information Management, acoustic and non-acoustic contact association, and the initial steps required to automate combat systems operations, in support of work load and manning reductions. FY09 through FY10 efforts will continue on improving the tactical commander's ability to manage close in and high density scenarios through advanced target motion analysis, contact management, tactical scene rendering, uncertainty management, and close encounter decision management. Efforts will continue to focus on more seamless integration of acoustic and non acoustic sensor information for tracking and command information. Efforts will begin to focus on new automated tracking technologies to assists combat control technicians.

	FY 2008	FY 2009	FY 2010
Advanced Sensors	13.500	8.340	8.600
RDT&E Articles Quantity	0	0	0

The Advanced Sensor Systems program is developing improved, larger aperture sonars and digital acoustic communications systems in order to achieve acoustic superiority. Current projects include Low Cost Conformal Array (LCCA) and a modular High Frequency (HF) contact management sonar that could be mounted on submarine sails.

Large Vertical Array (LVA), a Conformal Acoustic Velocity Sonar (CAVES)-based Medium Frequency (MF) ASW sonar that may be either stand alone or combined with two other LVAs to form a Large Wide Aperture Array (LgWAA) for VIRGINIA Class forward-fit; Fiber-Optic CAVES (FOCAVES) sensors and processing; Advanced Towed Array Technology (ATAT) - provides Twin Line Towed Array (TLTA) Capability); and ACOMMs, a digital Acoustic Communications system for submarines and surface ships. Continuing development of ATAT and initiate TLTL array and handler Component Integration Tests (CITs); building and planning to install LVA ADM; continuing surface ship MF ACOMMS development. In FY09, will conduct CAVES LVA sea test and analysis on 688 platform; develop and test Rapid COTS Insertion Next Generation (RCI NextGen) for CAVES LVA sea test; begin development of LCCA light weight Advanced Development Model (ADM); continue working with IWS 5B to develop surface ship ACOMMS and resolving encrypted ACOMMS submarine solution. Will select between twin-line towed array and vector sensor towed array for ATAT. Additionally, will begin scoping work and studies on a future submarine sensor design. In FY10 will

support PMS450 with CAVES LVA installation and at-sea test on VIRGINIA platform; finish development of light weight LCCA ADM; finish development of encrypted ACOMMS submarine solution; finish lightweight LCCA development and fabricate ADM; finish development of encrypted ACOMMS submarine solution.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

E. MAJOR PERFORMERS:

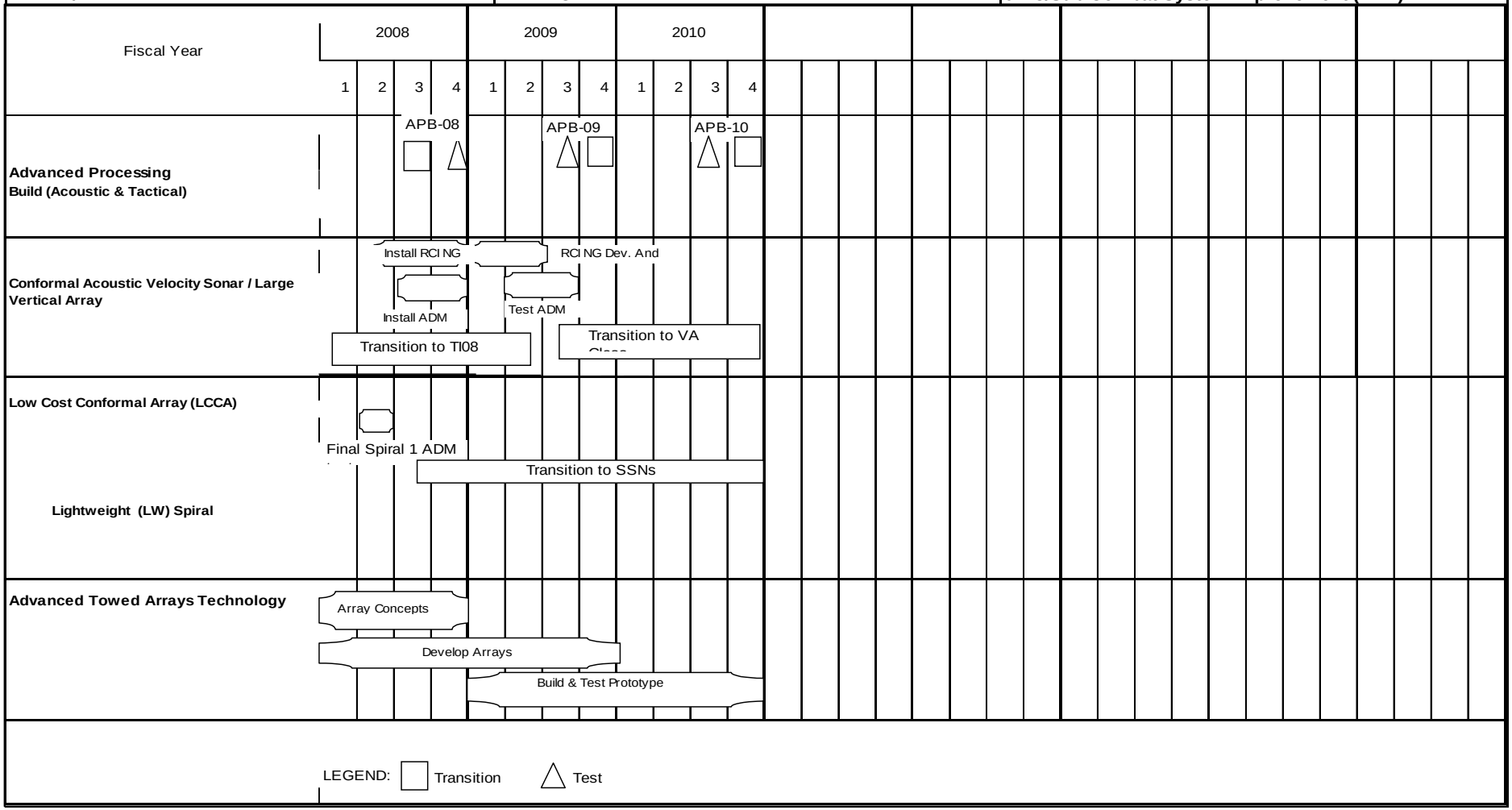
- Naval Undersea Warfare Center (NUWC), Newport, RI
- Naval Research Laboratory (NRL), Washington, DC.
- Naval Surface Warfare Center (NSWC), Carderock, MD.
- John Hopkins University/Applied Physics Lab (JHU/APL), Laurel, MD
- University of Texas/Applied Research Laboratory (UT/ARL), Austin, TX
- MITRE Corporation, McLean, VA
- Lincoln Laboratories, Cambridge, MA
- General Dynamic/Advanced Information Systems, Fairfax, VA
- Lockheed Martin, Manassas, VA
- Chesapeake Sciences, Millersville, MD
- Progeny Systems, Salt Lake City, UT

Note: All performers support APB(A), APB(T) and Sensors.

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**					
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
Product Development	WR	NUWC/Newport, RI	41.095			10.218	OCT-08	10.648	OCT-09			
Product Development	WR	NRL, DC	0.446			0.000		0.000				
Product Development	WR	NSWC/Carderock, MD	13.661			5.024	OCT-08	4.500	OCT-09			
Product Development	WR	NSWC/Dahlgren, VA	0.490			0.050	OCT-08	0.050	OCT-09			
Product Development	WR	ONI, DC	0.045			0.000		0.000				
Product Development	C/CPFF	NSMA, VA	5.170			1.000	NOV-08	1.524	NOV-09			
Product Development	WR	ONR, VA	1.925			0.730	DEC-08	0.800	DEC-09			
Product Development	WR	SSC/San Diego, CA	1.340			0.050	OCT-08	0.050	OCT-09			
Product Development	WR	COMSUBLANT, VA	0.340			0.100	OCT-08	0.125	OCT-09			
Product Development	WR	COMSUBPAC, HI	0.360			0.100	OCT-08	0.125	OCT-09			
Product Development	MIPR	U.S. Army/MITRE, NJ	2.800			0.000		0.000				
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs, MA	5.384			1.890	DEC-08	2.000	NOV-09			
Product Development	C/CPFF	PSU/ARL, PA	0.390			0.000		0.000				
Product Development	C/CPFF	PSU/ARL, PA	1.100			0.200	DEC-08	0.250	DEC-09			
Product Development	C/CPFF	UT/ARL, TX	12.250			4.550	DEC-08	5.500	DEC-09			
Product Development	C/CPFF	JHU/APL, MD	28.903			6.660	DEC-08	7.100	DEC-09			
Product Development	C/CPFF	Lockheed Martin, VA	15.576			5.000	DEC-08	5.800	DEC-09			
Product Development	C/CPFF	Progeny, VA	1.957			0.200	DEC-08	0.350	DEC-09			
Product Development	C/CPFF	METRON, VA	2.858			0.600	DEC-08	0.800	DEC-09			
Product Development	C/CPFF	Alion Sciences, VA	1.867			1.417	DEC-08	1.400	DEC-09			
Product Development	C/CPFF	SEDNA, VA	2.164			0.500	DEC-08	0.500	DEC-09			
Product Development	C/CPFF	DSR/GD, VA	10.936			2.500	DEC-08	3.000	DEC-09			
Product Development	C/CPFF	Northrop Grumman, VA	0.400			0.000		0.000				
Product Development	WR	SPAWAR, CA	0.400			0.000		0.000				
Product Development	MIPR	U.S. Army Research Lab, MD	0.350			0.000		0.000				
Product Development	C/CPFF	SAIC, VA	0.500			1.000	DEC-08	1.500	DEC-09			
Product Development	C/CPFF	Adaptive Methods, VA	0.400			0.200	DEC-08	0.300	DEC-09			
Product Development	C/CPFF	AAC, NY	0.375			0.000		0.000				
Product Development	C/CPFF	GA Tech Research Institute, GA	2.120			0.150	DEC-08	0.300	DEC-09			

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**						
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
Product Development	C/CPFF	Multisensor Science, VA	0.150			0.150	DEC-08	0.200	DEC-09			
Product Development	MIPR	U.S. Army Research Lab, MD	0.650			0.300	DEC-08	0.300	DEC-09			
Product Development	C/CPFF	Chesapeake Science, MD	0.300			0.700	DEC-08	0.900	DEC-09			
Product Development	C/CPFF	Lockheed Martin, NY	3.000			2.000	JAN-09	3.000	DEC-09			
Subtotal Product Development			**159.702**			**45.289**		**51.022**				
Remarks:												
Program Management Support	C/CPFF	Stanley and Associates, VA	1.000			0.000		0.000				
Program Management Support	C/CPAF	BAE Systems, MD	4.335			1.460	DEC-08	1.600				
Program Management Support	C/CPFF	EG&G, VA	0.950			0.000		0.000				
Travel	WR	NAVSEA PEO IWS 5, DC	0.225			0.075	OCT-08	0.075				
Subtotal Management Services			**6.510**			**1.535**		**1.675**				
Remarks:												
Total Cost			**166.212**			**46.824**		**52.697**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **0223/Sub Combat System Improvement (ADV)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Advanced Processing Builds (Acoustic/Tactical):							
APB-07 Sea Test	4Q						
Transition APB-07 to ARCI/BYG-1	3Q						
APB-09 Sea Test		3Q					
Transition APB-09 to ARCI/BYG-1		4Q					
APB-10 Shore Test			3Q				
Transition APB-10 to ARCI/BYG-1			4Q				
Conformal Acoustic Velocity Sonar/Large Vertical Array:							
Install RCI Next Gen	2Q-4Q						
Develop and Test RCI Next Gen		1Q-3Q					
Install ADM Array	3Q-4Q						
Test ADM array		2Q-3Q					
Transition to T108	1Q-4Q	1Q-2Q					
Transition to VIRGINIA Class		3Q-4Q	1Q-4Q				
Low Cost Conformal Array (LCCA):							
Final Spiral 1Test ADM Array	2Q						
Transition to SSNs	3Q-4Q	1Q-4Q	1Q-4Q				
Advanced Towed Array Technology:							
Refine TLTL Concepts	1Q-4Q						
Develop TLTL/VSTA Array Technologies	1Q-4Q	1Q-4Q	1Q				
Build & Test Prototype TLTL/VSTA Arrays		1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**		PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	80.719	57.390	74.408
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Advanced Submarine Research and Development (R&D) Program is a non-acquisition program that develops, matures, and transitions Hull, Mechanical, and Electrical (HM&E) technologies from S&T to operational platforms, develops and demonstrates submarine design and naval architecture products destined for backfit, forward fit, and/or future submarines, and operates unique R&D experimentation, modeling, and simulation facilities to enhance submarine stealth, maneuverability, and affordability. The program is structured to support near term technology insertion to achieve VIRGINIA Class cost reduction and influence future submarine concepts and core technologies. In support of Sea Power 21, Sea Trial experimentation supports the naval enterprises in identifying and prototyping capabilities and technologies that support the warfighter. Focus is on the Undersea Enterprise (USE), the Naval Network/FORCENET Enterprise (NNFE), Naval Expeditionary Combat Enterprise (NECE), Surface Warfare Enterprise (SWE), and Special Operations Force Enterprise (SOFE). In addition to enterprise support, experimentation may identify, develop, integrate, and test Intelligence, Surveillance, and Reconnaissance (ISR) technologies and develop littoral precision strike capabilities that support the Overseas Contingency Operations (OCO). Experimentation and demonstration is conducted in a joint warfighting context with other services,(i.e. the U.S. Marines, U.S. Army, and the U.S. Air Force), to enable early assessment of warfighting capabilities, and to contribute to better technology selection decisions for potential incremental development. This program also supports Information Exchange Programs and potential joint project arrangements with the United Kingdom, Canada, and Australia.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Payloads and Sensors/Subtotal Cost	18.439	20.116	17.225
RDT&E Articles Quantity	0	0	0

Develop promising advanced technologies and/or concepts capable of revolutionizing submarine design, reducing cost, improving payload flexibility, increasing capability, reducing weight and space requirements, exploring alternative payload launch mechanisms, increasing reliability with concomitant decreases in required maintenance, and improving material strength. Develop payload demonstrations targeted at improving flexible ocean interface, Intelligence/Surveillance/Reconnaissance (ISR) requirements, and payload and launch retrieval methods from undersea platforms. Conduct Navy and joint SEA TRIALS that take the demonstrations to the Fleet in order to assess the operational value of the technologies and systems under consideration. The SEA TRIALS/experiments support examination and assessment of potential new Fleet capabilities based on the Sea Power 21 Pillars of SEA SHIELD, SEA BASING, SEA STRIKE, and FORCENET.

FY08 Accomplishments include the following: Prepared for FY09 demonstration of an underwater launch of an encapsulated All-Up Round (AUR) replica using a Short Burn Test Missile. Conducted an at-sea demonstration of the procedures developed and technologies selected under the Joint Test and Evaluation (JT&E) program Joint Command and Control for War on Terror Activities (JC2WTA). Conducted data analysis on Water Piercing Missile Launcher (WPML) test and conducted missile fly-out tests from a moving submerged translator platform. Provide SEA STALKER UUV capability to surface platform (DDG) by developing and testing the integration between the UUV and launching system. Serves as risk mitigation for SSGN demonstration.

FY09 Planned Accomplishments include the following: Redesign and rebuild test assets and complete the static underwater encapsulation tests at Aberdeen Test Center (ATC). Prepare for End-To-End lab set up at NUWC, Newport. Assess, refurbish, and test the equipment necessary for testing the capsule at periscope depth speeds at San Clemente Island (SCI) (Translation Testing). Conduct additional fly-out test from a moving submerged translator at higher cross current. Mature development of and test of a new launcher design with its own method of gas generation to aid water piercing. Provide SEA STALKER UUV capability to subsurface platform (SSGN) by developing and testing the integration between the UUV and launching system. Develop, test, and transition ISR technologies to support irregular warfare.

FY10 Planned Accomplishments include the following: For Small Missile Encapsulation (SME) conduct translation testing at SCI and complete analysis. Definitize WPML unique launcher design with gas generation and continue system engineering and safety tasks related to submarine integration. Conduct open ocean translator missile fly-out test. Develop, test, and transition ISR technologies to support irregular warfare.

	FY 2008	FY 2009	FY 2010
Stealth/Subtotal Cost	12.873	16.439	23.421
RDT&E Articles Quantity	0	0	0

Develop technologies and tools to increase the safety of submarines by recognizing and mitigating sources of noise, improving the probability of safe transit in the vicinity

of mine fields, ensuring that submarines can penetrate contested waters by reduced acoustic observables, and remaining undetected in the littorals. Develop technologies and tactics/techniques/procedures (TTPs) that will be integrated with existing naval assets to develop new or enhance existing warfighting concepts. Operate the Large Scale Vehicle (LSV 2) and the Intermediate Scale Measurement System (ISMS) to conduct large model experiments for submarines focusing on stealth, maneuvering and control, affordability, and operational effectiveness.

FY08 Accomplishments include the following: Continued LSV operations and maintained LSV and ISMS test ranges. Obtained relative model scale and full Alternating Current (AC) Electromagnetic Signature data to support development of propagation modeling techniques. Conducted hydro acoustic pressure testing of conformal array component test pieces utilizing newly developed materials to support qualification. Matured mine warfare Tactical Decision Aid (TDA) concepts to support future possible transition to Advanced Processing Build (APB) program. Completed comparison of coupled Reynolds Averaged Navier-Stokes/APL Wake Evolution Code (RANS/AWEC) wake signature prediction techniques to available model scale data. Completed initial signature assessment of future conformal array concepts. Developed plan to obtain full-scale wake signature data. Updated Submarine Stealth Planning Guide to reflect recent technology improvements.

FY09 Planned Accomplishments include the following: Continue Large Scale Vehicle operations and maintain LSV and ISMS test ranges. Develop coordinated integrated program plan with ONR and PMS450 to execute research and development related to flow-noise, future sonar concepts and structural acoustics. Perform concept design and fabrication of scale model Integrated Bow Conformal (IBC) structure utilizing newly developed castable polyurethane materials. Complete hydrostatic pressure testing of conformal array test articles using newly developed materials. Complete qualification testing on new conformal array material. Complete literature search to provide basis for development of multipurpose hull treatment materials for future platforms. Obtain relative full-scale data to support validation of modeling and analysis approaches related to AC Electromagnetic Signatures.

FY10 Planned Accomplishments include the following: Conduct LSV operations and maintain LSV and ISMS test ranges. Obtain relative full scale data to support validation of modeling techniques related to AC Signature propagation. Execute research and development related to flow-noise, future sonar concepts, and structural acoustics for ONR, PMS450, and future submarine programs. Complete manufacturing studies on new castable polyurethane materials to support future conformal array applications. Develop TTPs for integration and testing.

	FY 2008	FY 2009	FY 2010
Total Ownership/Affordability/Subtotal Cost	4.569	6.328	6.910
RDT&E Articles Quantity	0	0	0

Demonstrate technologies that have the potential to reduce total life cycle costs of the system by providing reduced construction costs, commonality of interfaces, longer life of parts, and/or lower maintenance requirements.

FY08 Accomplishments include the following: Initiated qualification testing on 10,000 and/or 20,000 in-lb 3-position rotary Electric Actuation Systems (EAS) Advanced Development Models (ADMs). Completed a Business Case Analysis (BCA) to replace 35 rotary 2 and 3 position hydraulic actuators with EASs. Completed a BCA to replace the

current Universal Modular Mast (UMM) hydraulic actuation system with an EAS. Initiated paper design of a UMM EAS. Completed a study to replace remaining hydraulic actuators with EAS in the sail and in the external hydraulics supply. Completed draft EAS performance specification for snorkel induction head valve, mast hoist system, and the radar in the sail. Performed EAS feasibility study of all SSBN hydraulic applications. Conducted engineering study of Common Electric Hull Penetrator (CEHP) design concepts. Conducted an engineering analysis and evaluation of laboratory scale trials and alternate chemistries for Carbon Dioxide (CO2) capture material to determine the optimum form of solid phase sorbent for an advanced CO2 removal system for submarine air purification. Completed report on SSN-690 (USS PHILADELPHIA) summarizing observations and recommendations from full-scale trial with modified damping configuration. Defined configuration for two modified SSN-668 platforms with modified Main Ballast Tank (MBT) treatment configurations. Obtained acoustic data on both platforms. Supported configuration of SSN-688I class submarine to address reduced maintenance requirements related to MBT Damping. Completed testing on VIRGINIA (VA) class Modular Integrated Deck Structures (MIDS) configuration with a cost reduction based damping configuration to support VA class cost reduction initiatives and database for future designs.

FY09 Planned Accomplishments include the following: Complete qualification testing on 10,000 and/or 20,000 in-lb 3-position rotary EAS ADMs. Plan and schedule for the at-sea retractable bow plane electric actuator demonstration. Initiate Temporary Alteration (TEMPALT) planning to demonstrate rotary EAS on an operational submarine. Conduct pop up and Intermediate Scale Measurement System tests to assess damping configuration. Complete UMM EAS design, Interface Control Drawings (ICDs), and build ADM. Complete CO2 scrubber sorbent material performance testing. Complete design and construction of a 1/10 th scale CO2 scrubber test unit for lab evaluation. Complete design of sorbent test cubes for shipboard testing. Complete BCA in support of implementing the new CO2 removal system. Complete report on trial of two SSN-688 class platforms with modified MBT Damping configurations to support reduction in maintenance requirements. Complete summary report on MIDS testing and associated analysis. Complete functional requirements, BCA, ICDs, arrangement studies and concept designs for replacing external hydraulic actuators with electric systems.

FY10 Planned Accomplishments include the following: Complete TEMPALT planning for an at-sea demonstration of rotary and UMM EAS. Acquire external EAS ADMs for test and evaluation. Build and lab test CO2 scrubber sorbent test cubes. Install test cubes for shipboard testing. Initiate design of full scale CO2 scrubber prototype system. Complete MBT Damping trial report on SSN-688I platform with modified configuration.

	FY 2008	FY 2009	FY 2010
Advanced Propulsion/Ship Concept Developments/Subtotal Cost	44.838	14.507	26.852
RDT&E Articles Quantity	0	0	0

Overcome selected technological barriers that are expected to have significant impact on submarine hull, mechanical, and electrical (HM&E) systems to enable design options for a submarine with VIRGINIA Class capability in three technical areas: Shaftless Propulsion, External Weapon Stow and Launch, and Radical Ship HM&E Infrastructure Reduction. Develop submarine alternative propulsion and stern configurations with potential to significantly reduce submarine acquisition cost. Demonstrate critical performance parameters via Appropriate Scale Demonstrators in realistic environmental conditions. Evaluate integration of technologies and approaches for cost reduction in future nuclear submarines. Develop understanding of ship concept studies and submarine cost drivers and model analysis. Develop and demonstrate technologies for a future SSBN in areas of hull and platform technologies, propulsors, ship control, electric actuation, sensors, and self defense. This work will apply to future submarine designs and will begin the long-lead concept work on the next undersea strategic deterrent platform, for which design work must begin in earnest early next decade. Conduct concept

studies and mission utility studies for variant submarine designs, including VIRGINIA derivatives. Develop a future undersea superiority system alternative to the reduced submarine program.

FY08 Accomplishments include the following: Completed component level TANGO BRAVO (TB) technology demonstrations. Demonstrated maneuvering and sea keeping aspects of Shaftless propulsion at small scale. Assessed Go/No Go for TB Phase 3 Shaftless Propulsion award. Completed load out demonstration and at-sea launch demonstration at depth of External Weapons Stow and Launch. Continued development of innovative technologies to support the undersea superiority initiative, Deep Water Active Detection System (DWADS), Reliable Acoustic Path (RAP) Line Array system, Shallow Water Array Processing (SWAP) system, Distributed Netted Sensors (DNS) Command Control and Communication system, Medium Frequency Acoustic Communications system, Deployable Autonomous Distributed System (DADS), and an ASW Command Common Tool Set. Continued studies, analysis and assessments of potential transformational submarine and ASW technologies. Conducted SBSD concept studies and technology trade studies to support Analysis of Alternatives (AoA) requirements development and R&D planning. Initiated planning for development of new technologies resulting from aforementioned studies. Performed Electromagnetic (EM) testing on Tango Bravo electric actuator at Groton, CT. Initiated electric actuator endurance test. Began partnership with DARPA on follow-on TB S3D project. Selected Submarine Shaftless Stern Demonstrator (S3D) vehicle platform and established performance requirements.

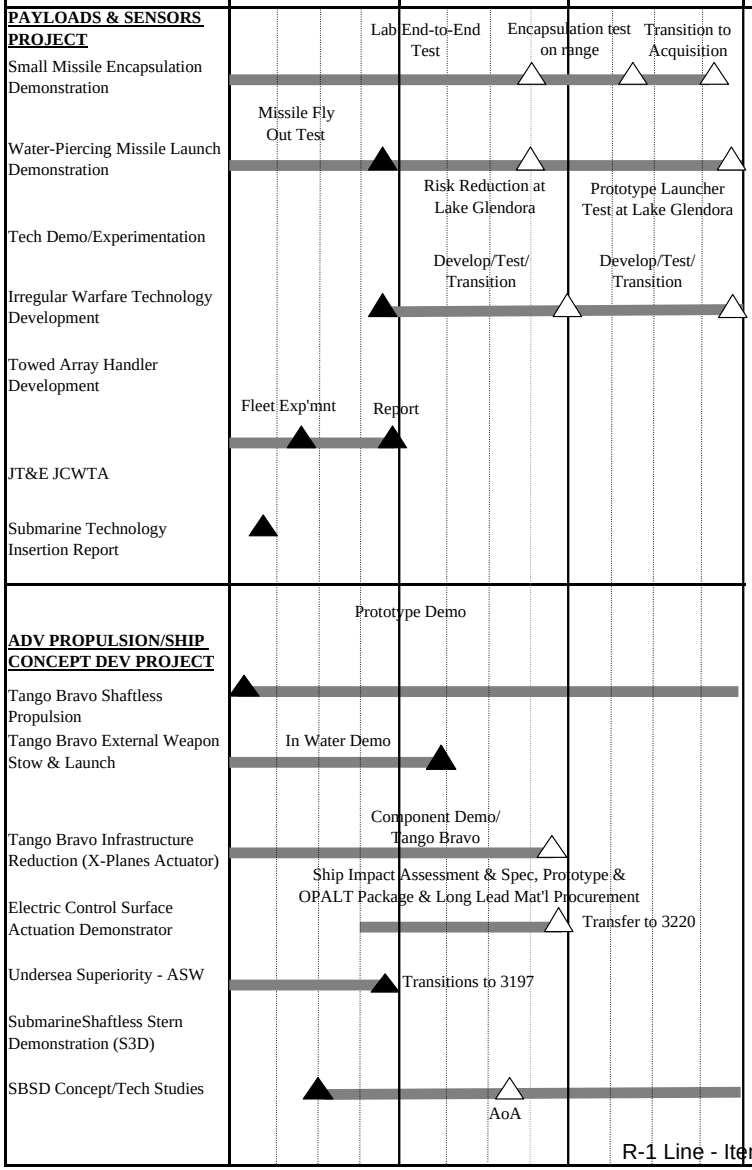
FY09 Planned Accomplishments include the following: Conduct TB demonstrations and acoustic modeling to reduce risk of proceeding to TB Shaftless Propulsion phase 3. Complete construction of shaftless demonstrator and commence demonstrating and performance testing. Complete External Weapons final report. Continue concept studies to support Sea Based Strategic Deterrent (SBSD) Analysis of Alternatives (AoA), requirements development and R&D planning. Complete the detail design of the Tango Bravo X-Planes electric actuator and ship control system modifications. Complete performance requirements, OPALT planning and procure long lead material for bow plane control surface electric actuator demonstration on SSN 774.

FY10 Planned Accomplishments include the following: Continue partnership with DARPA on follow-on TB S3D project. Continue concept studies to support Sea Based Strategic Deterrent (SBSD) requirements development and R&D planning. Complete demonstration and performance testing of TB Shaftless Propulsion prototype. Perform motor structural acoustic design and testing. Define vehicle interface and design modifications. Conduct radio control testing and hydro design model validation. Provide high-risk long lead-time procurements, Phase 2-3 cost estimate, and cost model update.

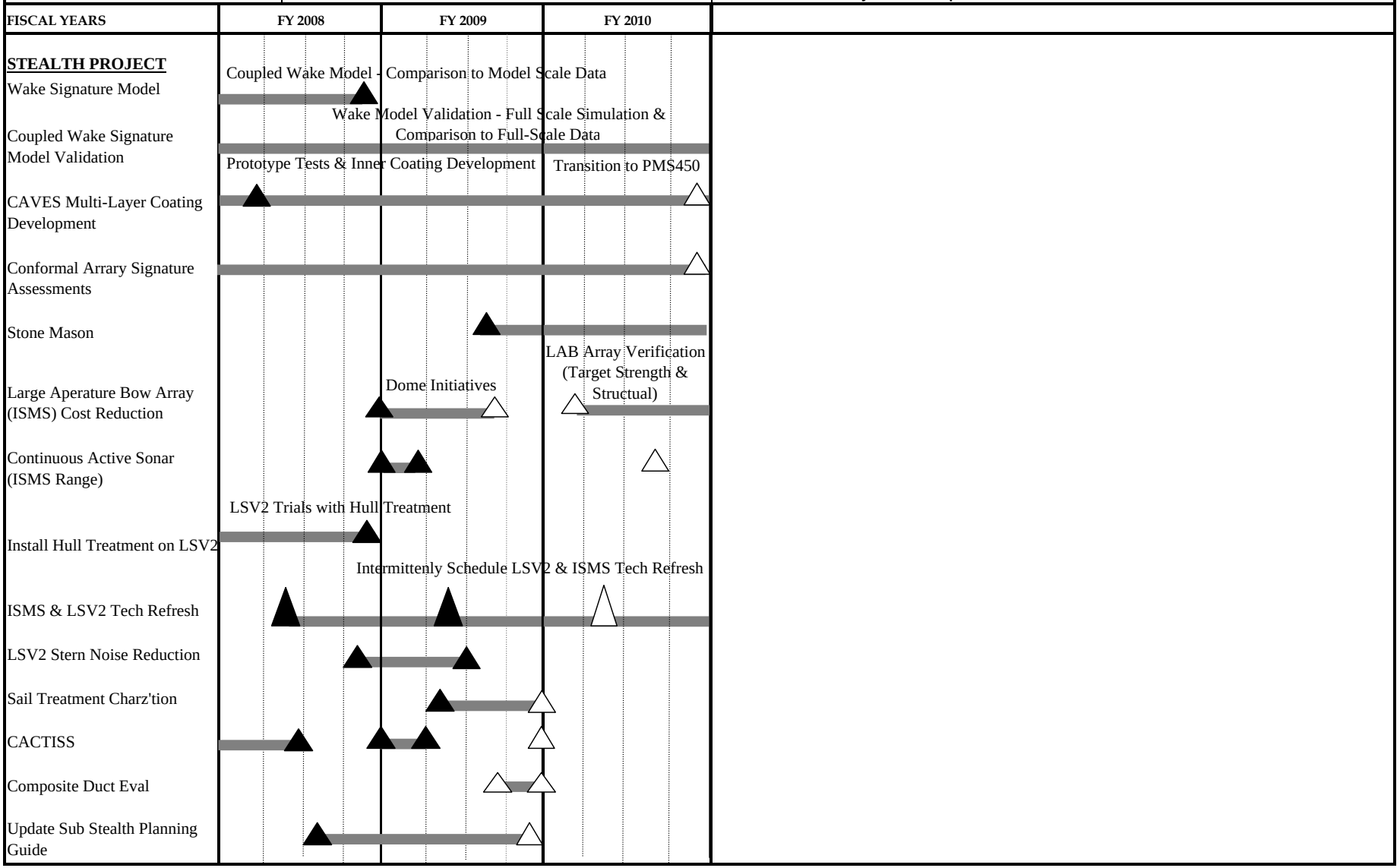
CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**					
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			
Product Development	SS/CPFF	NGSB Newport News, VA	1.553			0.529	VAR	1.000	VAR			
Product Development	WX	NSWC Dahlgren	0.000			1.320	VAR	3.920	VAR			
Product Development	WX	Kollmorgen, N. Hampton, MA	0.000			1.000	VAR	0.100	VAR			
Product Development	SS/CPFF	EB Groton, CT	3.763			6.202	VAR	1.000	VAR			
Prodcut Development	SS/CPFF	EB Groton, CT	0.000			0.000		15.510	VAR			
Product Development	SS/CPFF	Raytheon	10.355			4.182	VAR	1.517	VAR			
Product Development	WX	NSWC Bethesda, MD	24.794			17.171	VAR	18.634	VAR			
Product Development	SS/CPFF	ARL/PSU, State College,PA	0.956			1.931	VAR	1.500	VAR			
Product Development	SS/CPFF	UT/ARL, Austin TX	6.050			0.000		0.000				
Product Development	SS/CPFF	JHU/APL Laurel MD	14.834			0.220	VAR	0.100	VAR			
Product Development	Various	Various	19.912			0.370	VAR	7.857	VAR			
Product Development	WX	NUWC Newport, RI	10.526			4.471	VAR	11.510	VAR			
Product Development	RX	NUWC Newport, RI	22.971			5.368	VAR	0.000				
Product Development	WX	ONR, Arlington, VA	8.066			0.000		0.000				
Product Development	WX	Lockheed Martin	8.934			0.000		0.000				
Product Development	WX	SPAWAR San Diego CA	5.250			0.600	VAR	0.000				
Product Development	WX	SSP, Arlington VA	1.200			0.000		0.050	VAR			
Subtotal Product Development			**139.164**			**43.364**		**62.698**				
Remarks: Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.												
Contractor Engineering Support	SS/CPFF	Various	4.169			1.893	VAR	1.450	VAR			
Government Engineering Support	WX	Various	1.740			1.089	VAR	1.189	VAR			
Travel	WX	NAVSEA HQ	0.160			0.159	VAR	0.090	V			
Subtotal Support Costs			**6.069**			**3.141**		**2.729**				
Remarks: Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.												
Developmental Test & Evaluation	SS/CPFF	EB	0.600	0.000		1.771	VAR	1.456	VAR			

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**						
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
Developmental Test & Evaluation	SS/CPFF	Raytheon	6.710			1.394	VAR	1.000	VAR			
Developmental Test & Evaluation	WX	NAVAIR	1.395			0.635	VAR	0.000	VAR			
Developmental Test & Evaluation	Various	Various	1.745			0.919	VAR	2.572	VAR			
Developmental Test & Evaluation	WX	NUWC Newport	0.935			0.467	VAR	0.670	VAR			
Developmental Test & Evaluation	WX	NSWC Carderock	2.076			3.091	VAR	2.500	VAR			
Developmental Test & Evaluation	SS/CPFF	NGSB, Newport News VA	0.000			0.000	VAR	0.783	VAR			
Developmental Test & Evaluation	SS/CPFF	JHU/ARL, Laurel MD	0.000			0.005	VAR	0.000				
Developmental Test & Evaluation	SS/CPFF	ARL/PSU, State College PA	0.000			0.720	VAR	0.000				
Developmental Test & Evaluation	WX	NAVAIR, Pax River MD	0.000			0.563	VAR	0.000				
Developmental Test & Evaluation	WX	NSWC Dahlgren VA	0.000			1.320	VAR	0.000				
Subtotal Test and Evaluation			**13.461**			**10.885**		**8.981**				
Remarks: Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.												
Total Cost			**158.694**			**57.390**		**74.408**				

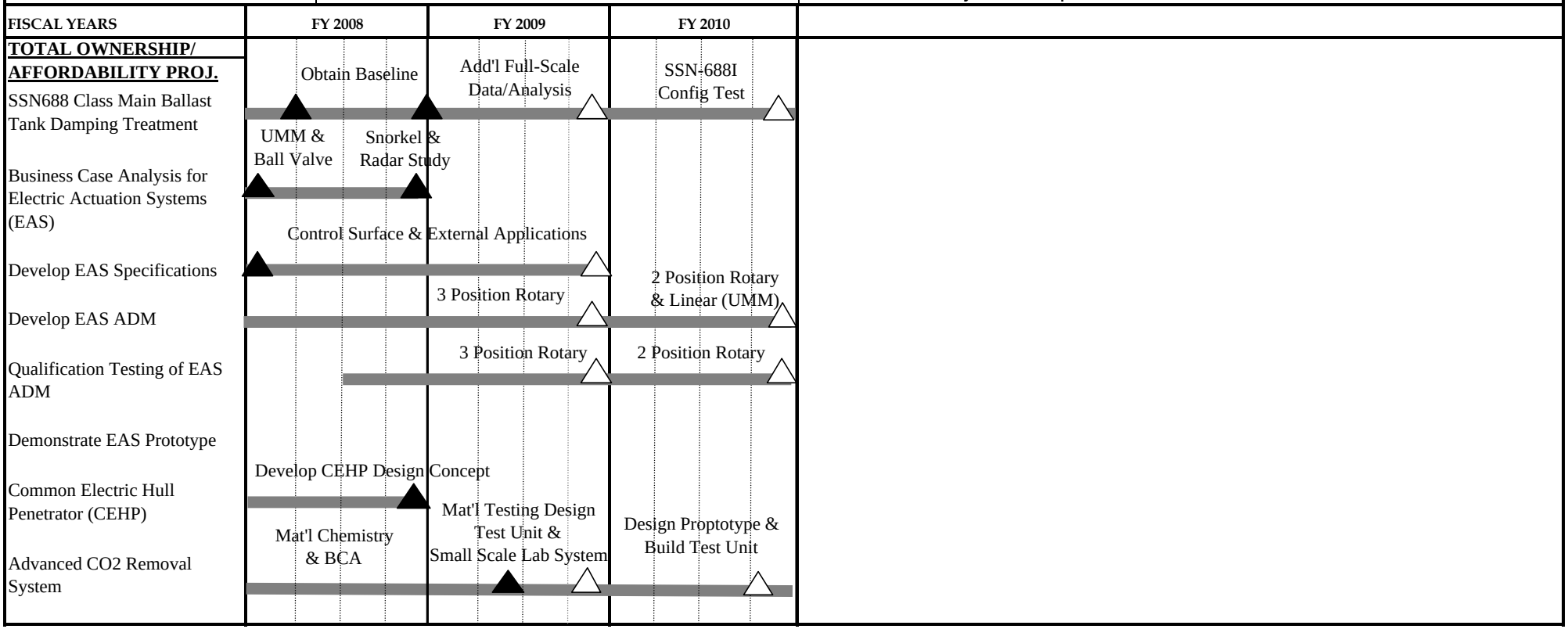
CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT	PROJECT NUMBER AND NAME 2033/Adv Submarine System Development Continued



CLASSIFICATION:	UNCLASSIFIED	
	EXHIBIT R-4, SCHEDULE PROFILE	DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT	PROJECT NUMBER AND NAME 2033/Adv Submarine System Development Continued



CLASSIFICATION:	UNCLASSIFIED	
	EXHIBIT R-4, SCHEDULE PROFILE	DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT	PROJECT NUMBER AND NAME 2033/Adv Submarine System Development



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Payloads & Sensors Project							
Small Missile Static Testing (ATC) and AUR/SBTM flyout	4Q	2Q					
Small Missile Encapsulation Full-Scale Translation Testing (SCI)		4Q	1Q				
Small Missile Encapsulation Final Report/Transition to Acquisition			4Q				
Water Piercing Missile Launch Fly Out Test	3Q-4Q						
Water Piercing Missile Launch Open Sea Confidence Test		3Q	3Q				
Water Piercing Missile Launch At-Sea Prep & Demo			4Q				
Irregular Warfare Technology Development	4Q	1Q-4Q	1Q-4Q				
JT&E JC2WTA - Fleet Experiment	2Q-4Q						
SUBTech Report	1Q						
Adv. Propulsion/Ship Concept Development Project							
Tango Bravo Shaftless Propulsion	1Q-4Q	1Q-4Q	1Q-4Q				
Tango Bravo External Weapon Stow & Launch	1Q-4Q	1Q					
Tango Bravo Infrastructure Reduction	1Q-4Q	1Q-4Q					
Electric Control Surface Actuation Demo		1Q-4Q					
Undersea Superiority - ASW	1Q-4Q						
SBSD Concept/Tech Studies	2Q-4Q	1Q-4Q	1Q-4Q				
Stealth Project							
Wake Signature Prediction Capability	1Q-4Q						
Wake Signature Tool Validation	1Q-4Q	1Q-4Q	1Q-4Q				
CAVES Multi-Layer Coating Development	1Q-4Q	1Q-4Q	1Q-4Q				
Conformal Array Signature Assessment	1Q-4Q	1Q-4Q	1Q-4Q				
Tactical Decision Aid Interface Development & Testing	1Q-4Q	1Q-4Q					
Large Aperture Bow Array Cost Reduction	4Q	1Q-3Q	1Q-4Q				
Continuous Active Sonar	4Q	1Q	3Q				
Install Hull Treatment on LSV2	1Q-4Q						
LSV2 & ISMS Technology refresh	2Q	2Q	2Q				
LSV2 Stern Noise Reduction	4Q	1Q-2Q					
Sail Treatment Characterization		1Q-4Q					
CACTISS	1Q-2Q; 4Q	1Q; 4Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL (CONTINUATION)					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **2033/Adv Submarine System Development**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Composite Duct Eval, LSV2 (VIRGINIA Cost Savings)		3Q-4Q					
Stone Mason		3Q-4Q	1Q-4Q				
Update Submarine Stealth Planning Guide (SPG)	3Q-4Q	1Q-4Q					
Total Ownership/Affordability Project							
Business Case Analysis for EAS	1Q-4Q						
Develop EAS Specifications	1Q-4Q	1Q-4Q					
Develop EAS ADM's	1Q-4Q	1Q-4Q	1Q-4Q				
Qualification Testing of EAS ADMs	2Q-4Q	1Q-4Q	1Q-4Q				
Initiate/Complete shore-based testing/validation on 8 ADMs	1Q-4Q	1Q-4Q	1Q-4Q				
SSN-688 Class Main Ballast Tank Damping Treatment	1Q-4Q	1Q-4Q	1Q-4Q				
Advanced CO2 Removal System	1Q-4Q	1Q-4Q	1Q-4Q				
Develop Common Hull Penetrator (CEHP) Design Concept	1Q-4Q						

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Overseas Contingency Operations**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	0.000	0.000	9.000
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The project Scan Eagle operations from an SSGN intends to provide persistent, maritime and littoral network connectivity, surveillance and reconnaissance capabilities within localized mission areas. The Scan Eagle Unmanned Aerial Vehicle (UAV) is a multi-mission Intelligence, Surveillance, and Reconnaissance (ISR) system to support strike, signals intelligence, and communications relay while operating in direct collaboration with other deployed assets in OCO. The UAV will conduct localized open-ocean and littoral surveillance of targets as well as providing network connectivity for deployed unattended sensors. This UAV integration effort delivers launch, control, and recovery ability from a SSGN within an integrated joint ISR architecture, providing the information to the joint force and localized commanders in real time. This is a key role in providing the commander with a persistent, reliable picture of surface and ground threats while minimizing the need to put manned assets in harms way to execute surveillance and reconnaissance and Information Operation (IO) tasks.

Develop the modifications for an SSGN Payload tube for over the Horizon ISR capability with enhanced endurance and payloads in support of OCO. The design and integration of an autonomous integrated controller, Scan Eagle launcher, and recoverysystem into SSGN payload tube. The stowage module will be modified to support the required physical interfaces to support the modified scan eagle launcher and recovery mast, and the packaged scan eagle UAV and supporting payloads. The accomplishments are in design a mechanism to support the the extension of the retrieval mast integration interfaced to the platforms decks, modification of the launcher to decrease weight and footprint, and repackaging of the Scan Eagle equipment and payload to physically interface to the wet stowage module for storage and maintenance prior to a surfaced deployment. The activity will design, test, and demonstrate the components and culminate an at-sea demonstration and deployment in the fourth quarter of FY10.

B. ACCOMPLISHMENT/PLANNED PROGRAMS:

FY10 Planned Accomplishments include the following: Conduct integration of Scan Eagle Unmanned Aerial System (UAS) into a SSGN payload tube stowage module. Command and control Scan Eagle through an integrated SSGN based system with real time communications with UAV and networked sensors. Conduct modification of Scan Eagle Launcher system and recovery system integrated to SSGN deck and stowage module. Conduct risk mitigation demonstration and in theatre demonstration.

C. OTHER PROGRAM FUNDING SUMMARY 2033 Adv Submarine System Development:

Not applicable.

D. ACQUISITION STRATEGY:

Use existing contract vehicles

E. MAJOR PERFORMERS:

NUWC Newport, RI
Electric Boat Corp., Groton, CT
Oceaneering, Chesapeake, VA
NSWC Dahlgren, VA
Boeing, St. Louis MO

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**					PROJECT NUMBER AND NAME **2033/Adv Submarine System Development OCO Project**					
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
Product Development	WX	NUWC Newport, RI	0.000			0.000		0.500	VAR		0.500	0.000
Product Development	SS/CPFF	EB Groton, CT	0.000			0.000		1.250	VAR		1.250	0.000
Product Development	SS/CPFF	Oceaneering, Chesapeake, VA	0.000			0.000		2.250	VAR		2.250	0.000
Product Development	WX	NSWC Dahlgren, VA	0.000			0.000		0.500	VAR		0.500	0.000
Product Development	SS/CPFF	Boeing, St. Louis, MO	0.000			0.000		4.000	VAR		4.000	0.000
Product Development	WX	VARIOUS	0.000			0.000		0.500	VAR		0.500	0.000
Subtotal Product Development			**0.000**			**0.000**		**9.000**			**9.000**	**0.000**
Remarks: Various/VAR is used to group multiple activities with small funding levels and when multiple award dates are planned.												
Total Cost			**0.000**			**0.000**		**9.000**			**9.000**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
	EXHIBIT R-4, SCHEDULE PROFILE	DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **2033/Adv Submarine System Development OCO Project**

FISCAL YEARS	FY 2008	FY 2009	FY 2010
Oversea Contingency Operations			
Ship-Check/Survey of SSGN			
Intitiate System Safety Prog Plan & Cert.			
Initiate Design Mods of Launcher & Recovery Systems			
Eval of Integrated Payloads & System Architecture			
Initial Land Based Demo of Modified Launcher & Recovery System			
Design Mod to Subsystem Based on Land Based Demo			
Initiate SHIPALT Process for Integration of System onto SSGN			
At-Sea End-to-End Risk Mitigation Demo			
System Integration & Install of Deployable End-to-End Scan Eagle Capability			

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **2033/Adv Submarine System Development OCO Project**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Ship Check/Survey of SSGN			1Q				
Initiate System Safety Program Plan & Certification			1Q				
Initiate Design Modification of Launcher & Recovery Systems			1Q				
Evaluation of Integrated Payloads & System Architecture			2Q				
Initial Land Based Demonstration of Modified Launcher & Recovery Systems			2Q				
Design Modification to Subsystems Based on Land Based Demonstration			2Q				
Initiate SHIPALT Process for Integration of System onto SSGN			2Q				
At-Sea End-to-End Risk Mitigation Demonstration			3Q				
System Integration & Installation of Deployable End-to-End Scan Eagle Capability			4Q				

CLASSIFICATION:	UNCLASSIFIED			
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **3197/Undersea Superiority**
COST (In Millions)	FY 2008	FY 2009	FY 2010	
Project Cost	0.000	36.818	37.214	
RDT&E Articles Qty	0	0	0	

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project Unit 3197: This Project supports Navy Undersea Superiority through the application of advanced development and testing of organic and offboard sonar and tactical control systems. This Project transitions technologies developed by Navy technology bases, the private sector, ONR, Future Naval Capabilities, and DARPA. This non-acquisition Project addresses technology challenges to improve ASW in littoral and open ocean environments for a variety of operational missions by relevant tactical ASW capabilities. Prototype hardware / software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. Technologies are selected by the Chief of Naval Operation's (CNO) ASW Initiative which was established to support the CNO's vision to "fundamentally change the way ASW is currently conducted to render the enemy submarine irrelevant against US and coalition forces". It matures promising undersea warfare technologies via a spiral development methodology, establishes military utility through sea testing and self assessment, and supports transition to production as merited by results.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3197/Undersea Superiority**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Undersea Superiority	0.000	36.818	37.214
RDT&E Articles Quantity	0	0	0

FY09 through FY10 planned accomplishments include the following: Efforts will transition from funding under Project 2033 in FY08 to Project 3197 in FY09. Continue development of Deep Water Active Detection System (DWADS), Reliable Acoustic Path (RAP) Line Array system, Shallow Water Array Processing (SWAP) system, and Deployable Autonomous Distributed System (DADS) to include development, integration, prototyping, land based and at-sea testing of Advanced Development Models (ADMs) and conduct of Military Utility Assessments (MUAs). Development of Distributed netted Sensors Control and Communications capabilities will be included in DWADS and RAP efforts. Continue studies, analysis and assessments of potential transformational ASW technologies. Initiate planning for development of new technologies resulting from aforementioned studies.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

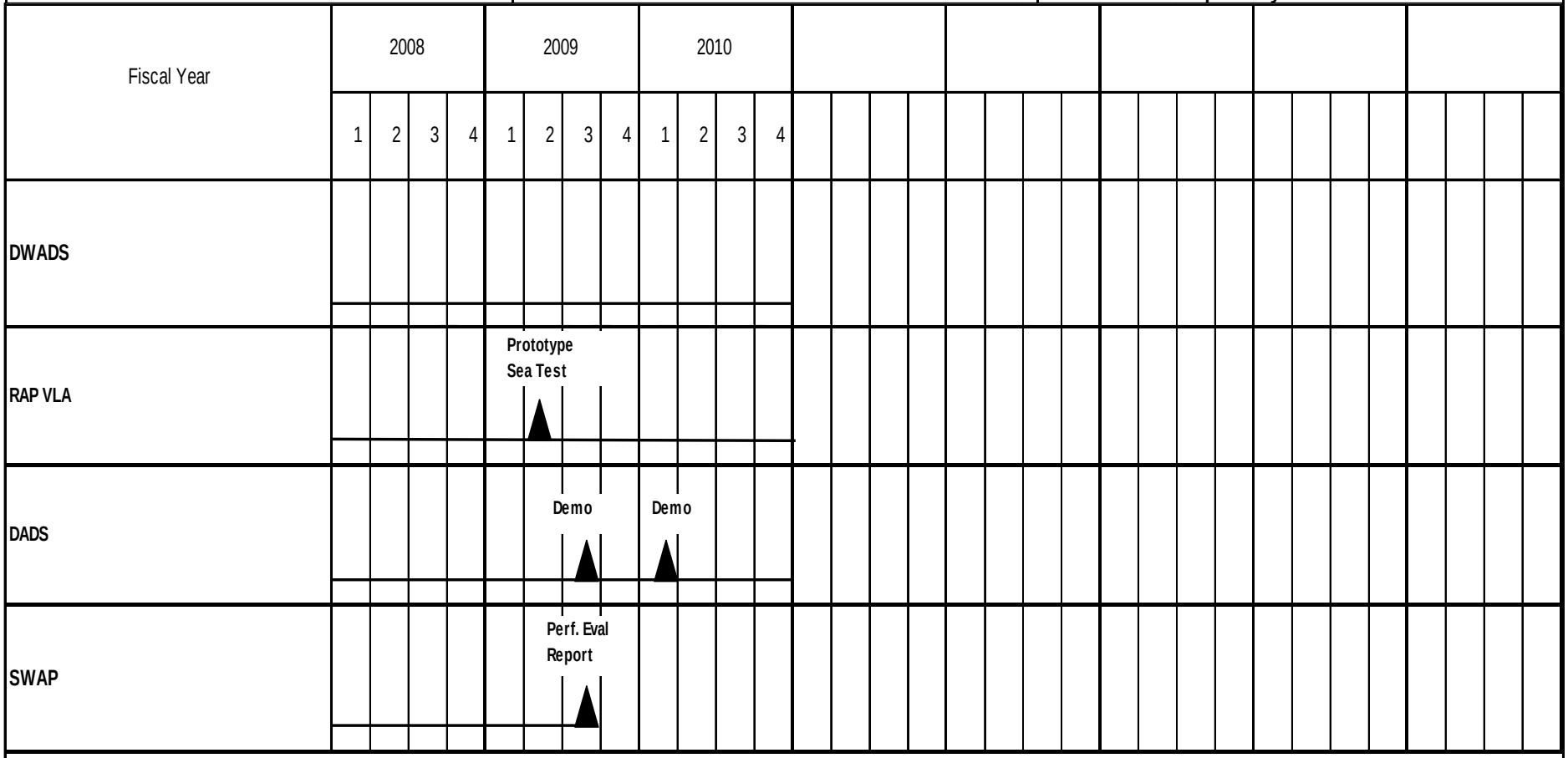
Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations.

E. MAJOR PERFORMERS:

- Naval Undersea Warfare Center (NUWC), Newport, RI
- John Hopkins University/Applied Physics Lab (JHU/APL), Laurel, MD
- University of Texas/Applied Research Laboratory (UT/ARL), Austin, TX
- Lockheed Martin, Manassas, VA
- Lockheed Martin, San Diego, CA

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **3197/Undersea Superiority**						
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
Product Development	WR	ONR, VA	0.000			2.000	NOV-08	2.100	NOV-09			
Product Development	WR	NUWC/Newport, RI	0.000			1.220	OCT-08	1.250	OCT-09			
Product Development	WR	Marine Acoustics Inc., NC	0.000			1.200	DEC-08	1.500	DEC-09			
Product Development	MIPR	U.S. AFB/MIT Lincoln Labs, MA	0.000			1.100	NOV-08	1.200	NOV-09			
Product Development	C/CPFF	JHU/APL, MD	0.000			5.400	DEC-08	5.500	DEC-09			
Product Development	C/CPFF	Lockheed Martin, VA	0.000			7.743	DEC-08	7.444	DEC-09			
Product Development	C/CPFF	SEDNA, VA	0.000			0.650	DEC-08	0.600	DEC-09			
Product Development	C/CPFF	SAIC, VA	0.000			0.720	DEC-08	0.700	DEC-09			
Subtotal Product Development			**0.000**			**20.033**		**20.294**				
Remarks:												
Test and Evaluation	WR	SPAWAR, San Diego, CA	0.000			0.800	OCT-08	0.825	OCT-09			
Test and Evaluation	WR	NUWC/Newport, RI	0.000			3.050	OCT-08	3.100	OCT-09			
Test and Evaluation	C/CPFF	JHU/APL, MD	0.000			2.600	DEC-08	2.500	DEC-09			
Test and Evaluation	C/CPFF	UT/ARL, TX	0.000			6.600	DEC-08	6.635	DEC-09			
Test and Evaluation	MIPR	U.S. AFB/MIT Lincoln Labs, MA	0.000			0.125	DEC-08	0.150	DEC-09			
Test and Evaluation	WR	Various, Various	0.000			3.200	DEC-08	3.300	DEC-09			
Subtotal Test and Evaluation			**0.000**			**16.375**		**16.510**				
Remarks: Note: "Various" is used in instances where multiple small (less than $1M) contracts are being utilized.												
Program Management Support	C/CPAF	BAE SYSTEMS, MD	0.000			0.400	DEC-08	0.400	DEC-09			
Travel	WR	NAVSEA PEO IWS 5, DC	0.000			0.010	OCT-08	0.010	OCT-09			
Subtotal Management Services			**0.000**			**0.410**		**0.410**				
Remarks:												
Total Cost			**0.000**			**36.818**		**37.214**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3197/Undersea Superiority**



Note: Previous to FY 09 this effort was funded via Project 2033.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME			
RDTEN/BA 4	**0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			**3197/Undersea Superiority**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Reliable Acoustic Path Vertical Line Array (RAP VLA):							
Prototype Sea Test		1Q					
ADM Sea Test							
Military Utility Assessment (MUA)							
Deployable Autonomous Distributed System (DADS):							
Technology Demonstration		3Q	1Q				
Shallow Water Array Processing (SWAP):							
Performance Evaluation Report		3Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	387.517				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The funding in this project will support the following key activities that are imperative for a successful ship acquisition needed for replacing the OHIO Class SSBN.
Those activities are:

1. Design and development of a missile compartment, its launch complex and strategic support systems to meet US strategic requirements and on a schedule that meets the President's direction (NOV 06) to support the United Kingdom (UK) in the replacement of its strategic deterrent, the VANGUARD Class SSBN.
2. Concept and System Definition for other portions of the ship (other than missile compartment) in order to maintain US synchronization with the missile compartment design efforts, which will provide a balanced and integrated US submarine design within US schedule requirements.
3. Development of advanced submarine platform technologies providing capabilities needed to preserve platform operational effectiveness and minimize the life cycle cost over its service life.

Activities planned for FY10 include the design of a missile compartment meeting both Navy's requirements, maturing enabling technologies; and development of a new launcher system providing adaptability and flexibility throughout the ship's life. Ship development efforts include important pre-construction activities such as studies of ship requirements, investigation of technology options, improvement and validation of performance prediction tools, and improvement of design tools. Platform technology development will address technologies that must be mature at or near the start of ship design. For certain technologies, such as the propulsor and electric actuation, development must begin in FY10 in order to attain the high level of maturity shown through experience to be essential for controlling cost and schedule risk throughout ship design and construction.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System Development**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	387.517
RDT&E Articles Quantity	0	0	0

SBSD Prototyping and Concept and System Definition

Planned FY10 Accomplishments include the following: Conduct trade studies, initiate concept and system definition efforts, and initiate technology demonstrations in the areas of propulsors, hull and platform technologies, electric actuation, and ship control. For missile compartment and strategic weapon system, begin design of the missile compartment along with development of an adaptable launch complex along with scale model and full scale prototyping as appropriate.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

The OHIO Class replacement will use a variety of acquisition strategies. The missile compartment must be designed and developed earlier than other parts of the ship in order to support the expressed intent of the President to support the UK in development of its own Successor SSBN program. It also preserves the potential for a common US-UK missile compartment, which would maximize the benefit of the ongoing US-UK partnership in strategic deterrence. Concept and System Definition efforts will be performed primarily by the US submarine shipyards. R&D efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers, as appropriate.

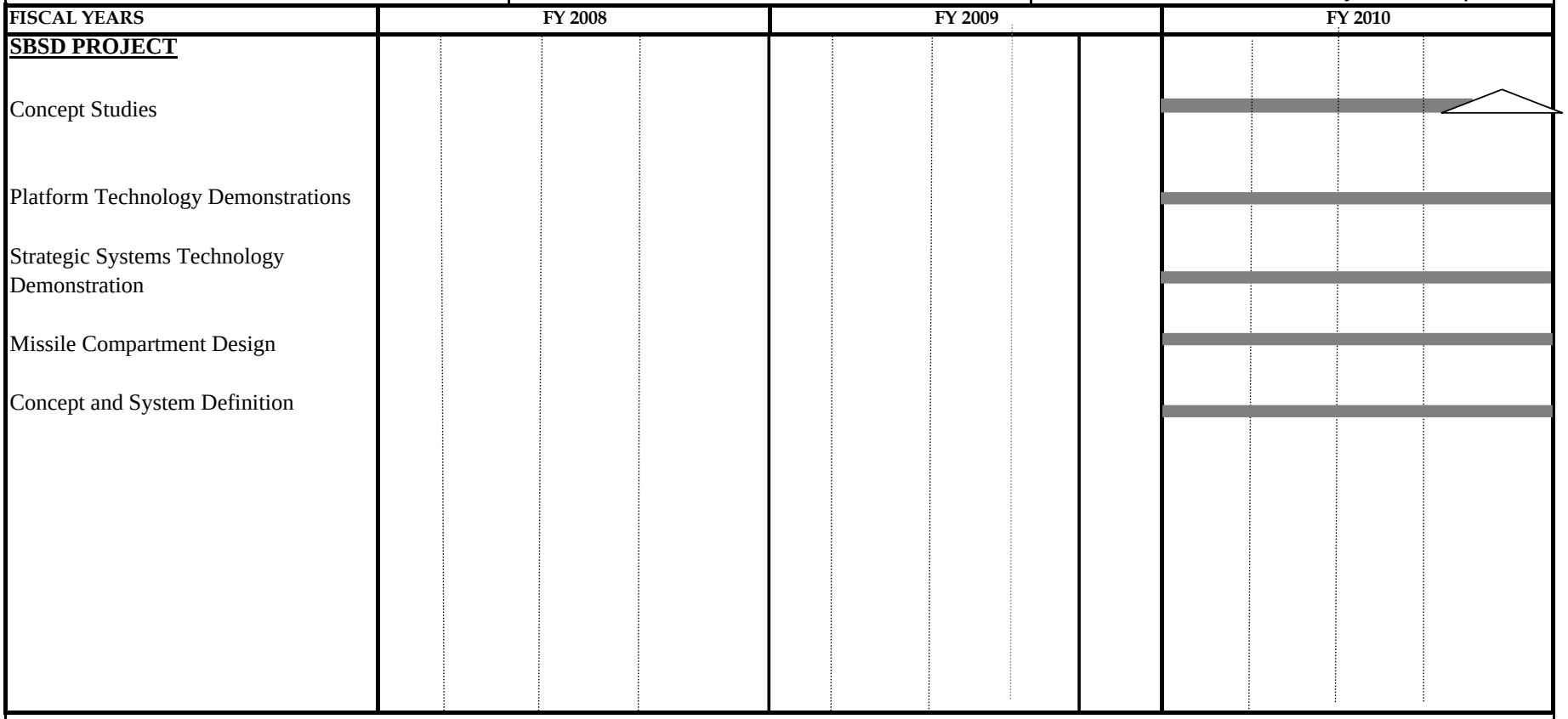
E. MAJOR PERFORMERS:

General Dynamics, Electric Boat Corp., Groton CT
Northrop Grumman Newport News Shipbuilding, Newport News VA
ARL Penn State, State College PA
Naval Surface Warfare Center, Carderock MD
Naval Undersea Warfare Center, Newport RI
Northrop Grumman Marine Systems, Sunnyvale, CA
Lockheed Martin Missiles and Space, Bethesda, MD
Draper Laboratories, Cambridge, MA

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System Development**						
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
Contractor Test and Evaluation Support	VAR	Various	0.000			0.000		1.000	VAR			
Government Test and Evaluation Support	WR	Various	0.000			0.000		1.000	VAR			
Travel	WR	NAVSEA HQ	0.000			0.000		0.100	OCT-09			
Subtotal Test and Evaluation			**0.000**			**0.000**		**2.100**				
Remarks: Note: Various is used for multiple activities with different award dates.												
Contractor Management Support	VAR	Various	0.000			0.000		8.000	VAR			
Government Management Support	WR	Various	0.000			0.000		10.000	VAR			
Travel	WR	NAVSEA HQ	0.000			0.000		0.200	OCT-09			
Subtotal Management Services			**0.000**			**0.000**		**18.200**				
Remarks: Note: Various is used for multiple activities with different award dates.												
Product Development	SS/CPIF	Ship Design Contractor	0.000			0.000		30.000	JAN-10			
Product Development	WR	NSWC Carderock MD	0.000			0.000		25.000	VAR			
Product Development	SS/CPFF	ARL PSU, State College PA	0.000			0.000		2.000	VAR			
Product Development	SS/CPIF	EB, Groton CT	0.000			0.000		32.500	VAR			
Product Development	SS/CPIF	NGSB, Newport News VA	0.000			0.000		26.700	VAR			
Product Development	SS/CPIF	NGMS, Sunnyvale CA	0.000			0.000		55.000	VAR			
Product Development	WR	NUWC Newport, RI	0.000			0.000		4.000	VAR			
Product Development	TBD	Missile Comp Design Contractor	0.000			0.000		130.000	JAN-10			
Product Development	WR	JHU-APL, Laurel MD	0.000			0.000		4.500	VAR			
Product Development	SS/CPIF	Missile Launch Sys Contractor	0.000			0.000		35.000	VAR			
Product Development	SS/CPIF	Draper Labs, Cambridge MA	0.000			0.000		5.000	VAR			
Product Development	SS/CPIF	Lockheed Martin Missiles and Space, Bethesda MD	0.000			0.000		15.000	VAR			
Product Development	VAR	Various	0.000			0.000		2.517	VAR			
Subtotal Product Development			**0.000**			**0.000**		**367.217**				
Remarks:												

CLASSIFICATION:	UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**				PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System Development**					
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
Note: Various is used for multiple activities with different award dates.												
Subtotal Support Costs			**0.000**			**0.000**		**0.000**				
Remarks:												
Total Cost			**0.000**			**0.000**		**387.517**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System Development**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**			PROJECT NUMBER AND NAME **3220/SBSD Advanced Submarine System Development**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Concept Studies			1Q-4Q				
Platform Technology Demonstrations			1Q-4Q				
Strategic Systems Technology Demonstrations			1Q-4Q				
Missile Compartment Design			1Q-4Q				
Concept and System Definition			1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	**9999/Congressional Add**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
0223A/Fiber Optic Conformal Acoustic Velocity Sensor (FOCAVES)	0.000	1.995	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to accelerate development of Fiber Optic Conformal Acoustic Velocity Sensor (FOCAVES) technology for the next generation SSN (Virginia Block IV) and the follow-on Strategic Based Sea Deterrent (next generation Ballistic Missile Submarine).

	FY 2008	FY 2009	FY 2010
9987N/Large Displacement UUV at Sea Launch & Recovery	3.000	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding will be used to define, document and provide interfaces, modular support equipment, and launch & recovery documentation for rapid affordable integration of Large Displacement UUVs and undersea payloads into SSGN Large Tubes. Land based facilities and in-water tests will be executed to demonstrate modular integration techniques and procedures. Payload interfaces and modular integration approach will maximize compatibility for potential use on other submarine classes.

	FY 2008	FY 2009	FY 2010
9B70A/Acoustic Materials for Integral Bow Conformal Array	0.972	0.000	0.000
RDT&E Articles Quantity	0	0	0

This funding will support research and development into the design and configuration of acoustic materials to support Integrated Bow Conformal Array concepts.

	FY 2008	FY 2009	FY 2010
9B71A/CISRT Enabling Materials Technology	2.314	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to develop the practical closure system utilizing shape memory or piezoelectric materials to secure payloads from salt water and sea pressure, which would be a significant technology enabler that would allow a wide variety of unmanned off board systems to be deployed. This effort includes systems engineering/analysis, test fixture development, design/development of subscale test items and evaluation testing.

	FY 2008	FY 2009	FY 2010
9B72A/Controllable Shock Absorber for Advanced Submarines	1.749	0.000	0.000
RDT&E Articles Quantity	0	0	0

This funding will be used to perform research and development associated with a controllable shock mitigation device for future submarine designs. This effort includes analysis, testing and evaluation of candidate concepts.

	FY 2008	FY 2009	FY 2010
9B73A/Low Cost Laser Module Assembly for High Frequency Fiber Optics	0.965	1.596	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to develop and evaluate promising laser interrogation technologies for a common towed array fiber optic receiver that is lower cost, more insensitive to

vibration, and more reliable than in current underwater fiber optic acoustic sensor systems. Service needs lower cost, more insensitive to vibration, and more reliable laser solutions for fiber optic towed array receivers.

	FY 2008	FY 2009	FY 2010
9B74A/Navy Submarine Hydraulic Oil Recycling and Waste Reduction	0.968	0.000	0.000
RDT&E Articles Quantity	0	0	0

This funding will support continuation of a Small Business Innovation Research (SBIR) project (N03-073) to develop an innovative high performance and high efficiency membrane hydraulic & lube oil filter. Plus-Up resources will fund a Phase II Base and Phase II Option Research and Development (R&D) effort.

	FY 2008	FY 2009	FY 2010
9B75A/Submarine Artificial-Intelligence (AI) Based Combat System Kernal	2.314	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to refine both the Process and Implementation aspects of the AI-based Mission-Focused Command Decision Support Module (MFCDSM) as an important component of the Combat System of the Future; to demonstrate several specific spirals; and to facilitate transitioning a basic capability to the fleet.

	FY 2008	FY 2009	FY 2010
9B76A/Twinline Thinline Submarine Towed Array	3.085	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funds will be used to continue the development of a submarine twinline thinline towed array capability to support Navy plans for an in-water demonstration in FY09. Service needs a twinline thinline towed array capability to provide a cost effective means to achieve significant improvements in Submarine ASW detection, fire control and self defense capabilities. The Add will be used to complete the design of the TLTL TA systems and initiate long lead procurements for material items.

	FY 2008	FY 2009	FY 2010
9B77A/Undersea Launched Missile Studies (ULMS)	4.862	3.190	0.000
RDT&E Articles Quantity	0	0	0

This funding will used to conduct concept studies for a follow-on platform to the OHIO Class submarine and to perform analyses and trade studies to identify necessary R&D to begin in FY 09 and beyond.

	FY 2008	FY 2009	FY 2010
9D33A/Acoustic Research Detachment Large Scale Vehicle	0.000	0.479	0.000
RDT&E Articles Quantity	0	0	0

This funding facilitates the installation of a new fiber optic cable to provide for remote data collection and recording, remote vehicle command and control, and reduced deployment costs.

	FY 2008	FY 2009	FY 2010
9D34A/Submarine Fatline Vector Sensor Towed Array (VSTA)	0.000	0.798	0.000
RDT&E Articles Quantity	0	0	0

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603561N/ADVANCED SUBMARINE SYSTEM DEVELOPMENT**	PROJECT NUMBER AND NAME **9999/Congressional Add**

Funds will be used to support the Navy's Sea Power 21 Anti-Submarine Warfare (ASW) mission objectives via the development and demonstration of a VSTA which will provide improved gain and better Target Motion Analysis (TMA). Improvements will include steering in the direction of interfering sources, and instantaneously resolving right-left ambiguity of a single line array without the need for ship maneuvering.

	FY 2008	FY 2009	FY 2010
9D35A/Submarine Littoral Defense System	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

This funding will be used to conduct as much of the San Clemente Island test objectives as possible in the following priority: Translation Testing, End-to-End System Demonstration, and Surface Target testing using AIM-9X Block II will Lock-On After Launch (LOAL) functionality.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	14.685	13.767	10.172				
0770 / Adv Sub Supp Equip Prog	4.215	4.349	4.374				
1739 / Submarine Arctic W/F Development	5.451	5.827	5.798				
9999 / CONGRESSIONAL ADDS	5.019	3.591	0.000				

A. MISSION DESCRIPTION:

The Submarine Tactical Warfare Systems program element is comprised of the Advanced Submarine Support Equipment Program (ASSEP) and the Submarine Special Operations Support Program. The objective is to improve submarine operational effectiveness through the development and implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, research and development efforts are focused on Advanced Imaging Developments and Advanced Electronic Warfare Support (ES) Developments. A continuing need exists to improve these capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense and sophisticated electronic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Ongoing developments in 360 degree imaging systems and radar range finding (PATRIOT) technologies are supporting these needs. The Submarine Arctic Warfare Development program responds to the increased threat of Naval activity in the Littorals and the continuing threat of submarine and surface ship activity in regions of the world through the development of advanced submarine R&D technology to provide improved operational capability in shallow water regions. Particular emphasis is placed in the areas of sonar operability and maintainability, Littoral operations, mine warfare, tactical surveillance, weapon utility and other submarine support missions. Efforts include assessment of combat system effectiveness, development of Arctic shallow water specific improvements for existing sonars and weapons, development of class specific Arctic operational guidelines and the testing of ice-capable submarine support structures. This program also provides the framework for various R&D programs to conduct Test and Evaluation in shallow water and Arctic regions.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	14.806	10.212	10.353
FY10 President's Budget	14.685	13.767	10.172
Total Adjustments	-0.121	3.555	-0.181
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	3.591	0.000
SBIR/STTR/FTT Assessment	-0.046	0.000	0.000
Program Adjustments	0.000	0.000	0.000
Rate/Misc Adjustments	-0.075	-0.036	-0.181
Total	-0.121	3.555	-0.181

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**				PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	4.215	4.349	4.374				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

A continuing need exists to improve Imaging and Electronic Warfare Support (ES) capabilities in view of the advancements in potential imaging counter detection, the need to support specialized missions and the increasingly dense electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ES and imaging to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection and Joint Strike. The program is divided into two project categories: Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development. Both of these categories will allow for the evaluation of the vulnerability of submarine masts, periscopes and sensors to visual, radar, and infrared detection and evaluation of state of the art technology to implement periscope/mast engineering improvements to reduce counter detection threats, the pursuit of technologies (such as PATRIOT LPI radar range finding and 360 degree imaging systems) to develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies available from DOD Exploratory Development Programs, industry Independent Research and Development, academia and other sources. Feasibility demonstration models (FDMs) are developed, evaluated, and validated in the lab and through at-sea testing.

The Advanced Imaging Project Development Projects Include the development of: 360 Degree Imaging - Far Term Advanced System, 360 Degree Imaging - Near Term System, 360 Degree Submarine Panoramic Infra-Red (SPIR) Imaging System, 360 Degree Affordable Modular Panoramic Periscope (AMPP), Low Cost Expendable Sensor (LCES), Advanced Head Window Water Shedding, Electro-Optic Diploops, and a Low Cost, Multi-Spectral, Grade A Head Window. The Advanced Electronic Warfare Support (ES) Development Projects include the development of: PATRIOT Phase B - Low Probability of Intercept (LPI) Radar, LPI Direction Finding (DF), Distant ES Support and Remote Log-In, Specific Emitter Identification (SEI) Improvements, ES Vulnerability Tool, Integrated ES and ECS Radio Frequency Distribution Unit (RFDU), Multi-function Modular Mast (MMM) Payloads, Mast Signature Reduction, PATRIOT Non-Scanning LPI Radar.

All programs funded in this project are non-acquisition category programs. Program plans and priorities are established by N87. The test articles identified consist of critical components that will be fully developed during engineering development into Engineering Development Models (EDMs). ASSEP Programs will eventually be broken down into initial and developmental research, for both Imaging and Electronic Warfare.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Advanced Imaging Project Development	2.310	2.263	2.537
RDT&E Articles Quantity	0	0	0

FY 08-10
360 Degree Imaging (JPL) - Far Term Advanced System
360 Degree Imaging ONR T18)- Near Term System
360 Degree Submarine Panoramic Mid-Wave Infra-Red (MWIR) Imaging System
360 Degree Affordable Modular Panoramic Periscope (AMPP)
Low Cost Expendable Sensor (LCES)
Advanced Head Window Water Shedding
Electro-Optic Diploops
Low Cost, Multi-Spectral Grade A Head Window

	FY 2008	FY 2009	FY 2010
Advanced Electronic Warfare Support (ES) Project Development	1.905	2.086	1.837
RDT&E Articles Quantity	0	0	0

FY 08-10
PATRIOT Phase B - Low Probability of Intercept (LPI) Radar
Capability Insertions (CI)
- LPI Direction Finding (DF)
- Distant ES Support and Remote Log-In
- Specific Emitter Identification (SEI) Improvements
- ES Vulnerability Tool
- Integrated ES and ECS Radio Frequency Distribution Unit (RFDU)

Multi-function Modular Mast (MMM) Payloads
Mast Signature Reduction
PATRIOT Non-Scanning LPI Radar

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

(U)Other Program Funding Summary: Not applicable.

(U) Related RDT&E: Not applicable.

D. ACQUISITION STRATEGY:

This project optimizes technology insertion using a build-test-build approach to support ES and imaging operational needs. Operational needs have been based on the tactical requirements identified in CNO letters, Serial N77/3U629212, dated 04 Sep 03, Serial N77/3U629205, dated 01 Apr 03, and Serial N77/1U651534, dated 30 Oct 01, COMSUBLANT/COMSUBPAC Command Capability Issues (CCIs), Virginia Class SSN Operational Requirements Document objectives, a review, assessment and prioritization of Sensor and Processor efforts and SSN force level projections for SSN688/688I, SSN21, and SSN 774 classes through FY2010. Project efforts develop submarine unique improvements to mast, periscope, and ES electromagnetic and electro-optic sensors based on emerging technologies that are available from DOD Exploratory Development Programs, industry Independent Research and Development, and other sources. Feasibility Demonstration Models (FDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.

E. MAJOR PERFORMERS:

NAWC, China Lake, CA

NUWC, Newport, RI

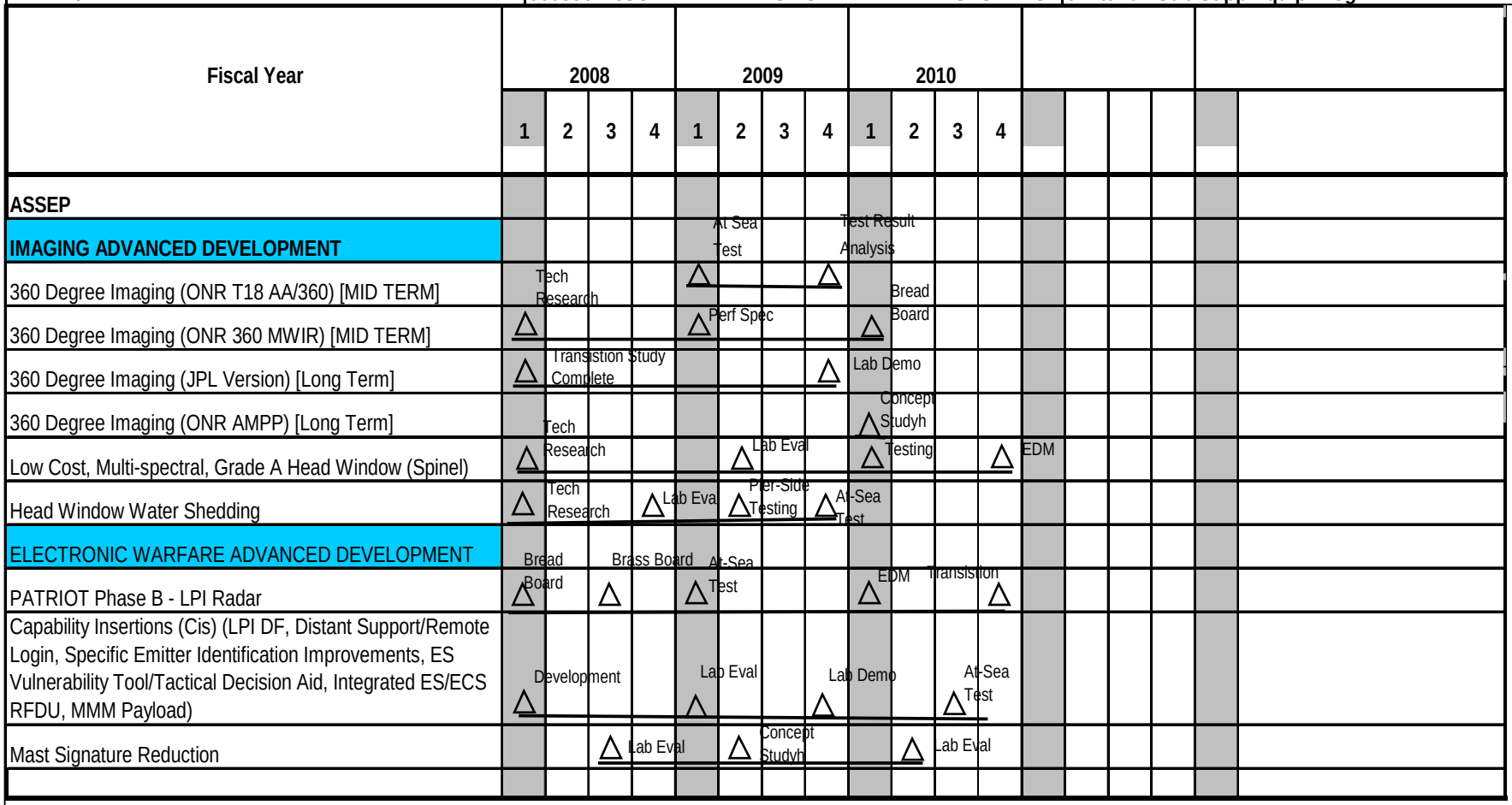
NASA JPL, Pasadena, CA

JHU, Columbia, MD

Navy Research Laboratories (NRL)

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARI**			PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**					
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			
Primary Hardware Development	SS/CPIF	JPL/NRL	4.865	1.457	OCT-08	1.781	OCT-09			
Systems Engineering	WR	NUWC Newport, RI	2.789	0.969	OCT-08	1.473	OCT-09			
Systems Engineering	WR/RC	NAWC China Lake	4.441	1.225	OCT-08	0.194	OCT-09			
Subtotal Product Development			**12.095**	**4.082**		**4.106**				
Remarks:										
Engineering Technical Services	CPAF	AT&T GSI, Vienna, VA	0.650	0.230	FEB-09	0.235	FEB-10			
Subtotal Support Costs			**0.650**	**0.230**		**0.235**				
Remarks:										
Travel	WR	Various	0.090	0.037	VAR	0.033	VAR			
Subtotal Management Services			**0.090**	**0.037**		**0.033**				
Remarks:										
Total Cost			**12.835**	**4.349**		**4.374**				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4, SCHEDULE PROFILE			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**		PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**			PROJECT NUMBER AND NAME **0770/Adv Sub Supp Equip Prog**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
360 Degree Imaging (ONR) - T18 - (At-Sea Test)		Q1					
360 Degree Imaging (ONR) - T18 - Term - (Complete Testing)		Q4					
360 Degree Imaging (ONR) - MWIR - (Technology Research)	Q1						
360 Degree Imaging (ONR) - MWIR - (Performance Specification)		Q1					
360 Degree Imaging (ONR) - MWIR - (Bread Board)			Q1				
360 Degree Imaging (JPL.) - MWIR - (Lab/Pier Demonstration)		Q4					
360 Degree Imaging (JPL) - High Resolution (Encapsulation)			Q4				
Low Cost, Multi-Spectral, Grade A, Head Window - (Concept Study)	Q1						
Low Cost, Multi-Spectral, Grade A, Head Window - (Lab Evaluation)		Q2					
Low Cost, Multi-Spectral, Grade A, Head Window - (Testing)			Q1				
Low Cost, Multi-Spectral, Grade A, Head Window - (EDM)			Q4				
PATRIOT Phase B - LPI Radar - (Bread Board)	Q1						
PATRIOT Phase B - LPI Radar - (Brass Board)	Q3						
PATRIOT Phase B - LPI Radar - (At-Sea Testing)		Q2					
PATRIOT Phase B - LPI Radar - (EDM)			Q1				
PATRIOT Phase B - LPI Radar - (Transition)			Q4				
Capability Insertions (CI) - (Algorithm Development and Testing)	Q1						
Capability Insertions (CI) - (Lab Evaluation)		Q1					
Capability Insertions (CI) - (Lab Demo)		Q4					
Capability Insertions (CI) - (At-Sea Testing)			Q3				
Mast Signature Reduction - (Concept Studies)		Q2					
Mast Signature Reduction - (Lab Evaluations)	Q3		Q2				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**				PROJECT NUMBER AND NAME **1739/Submarine Arctic W/F Development**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	5.451	5.827	5.798				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Submarine Arctic Warfare Development Project responds to the increased threat of Naval activity in the littoral and continuing threat of submarine and surface ship activity in all regions of the world through the development of advanced submarine concepts. It places particular emphasis on submarine operability and mission support in unique environments. Efforts include assessment of combat system effectiveness, weapons testing, use of high frequency sonars in Arctic regions, testing of ice-capable submarine structures, and development of class specific Arctic shallow water operational guidelines. This Project also provides the framework for various R&D programs to conduct test and evaluation in shallow water and Arctic regions.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	PROJECT NUMBER AND NAME **1739/Submarine Arctic W/F Development**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camp	5.451	5.827	5.798
RDT&E Articles Quantity	0	0	0

FY09-10 Plans:

Conduct Ice Exercise (ICEX) mission, Arctic transit mission, ICEX workup, ICEX training, and Ice Camp. Provide planning and logistics, and support Ice Camp Operations and Scientific Ice Expedition (SCICEX) accommodations. Support Arctic deployments, including inter-fleet transfers, as required by the Submarine Force Commanders. Investigate, research, develop and deploy new systems for Arctic submarine support. Support testing and tactical development required to improve submarine Arctic operability and warfighting. Coordinate and provide technical and logistical support for the Ice Camp in the Arctic Ocean in FY09 through FY10.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

Use sole source and competitively awarded contracts through the Fleet Industrial Supply Center (FISC) regional contracting office for equipment and technical services. NAVSEA university omnibus contract will be used for procurement of logistics support for Ice Camps.

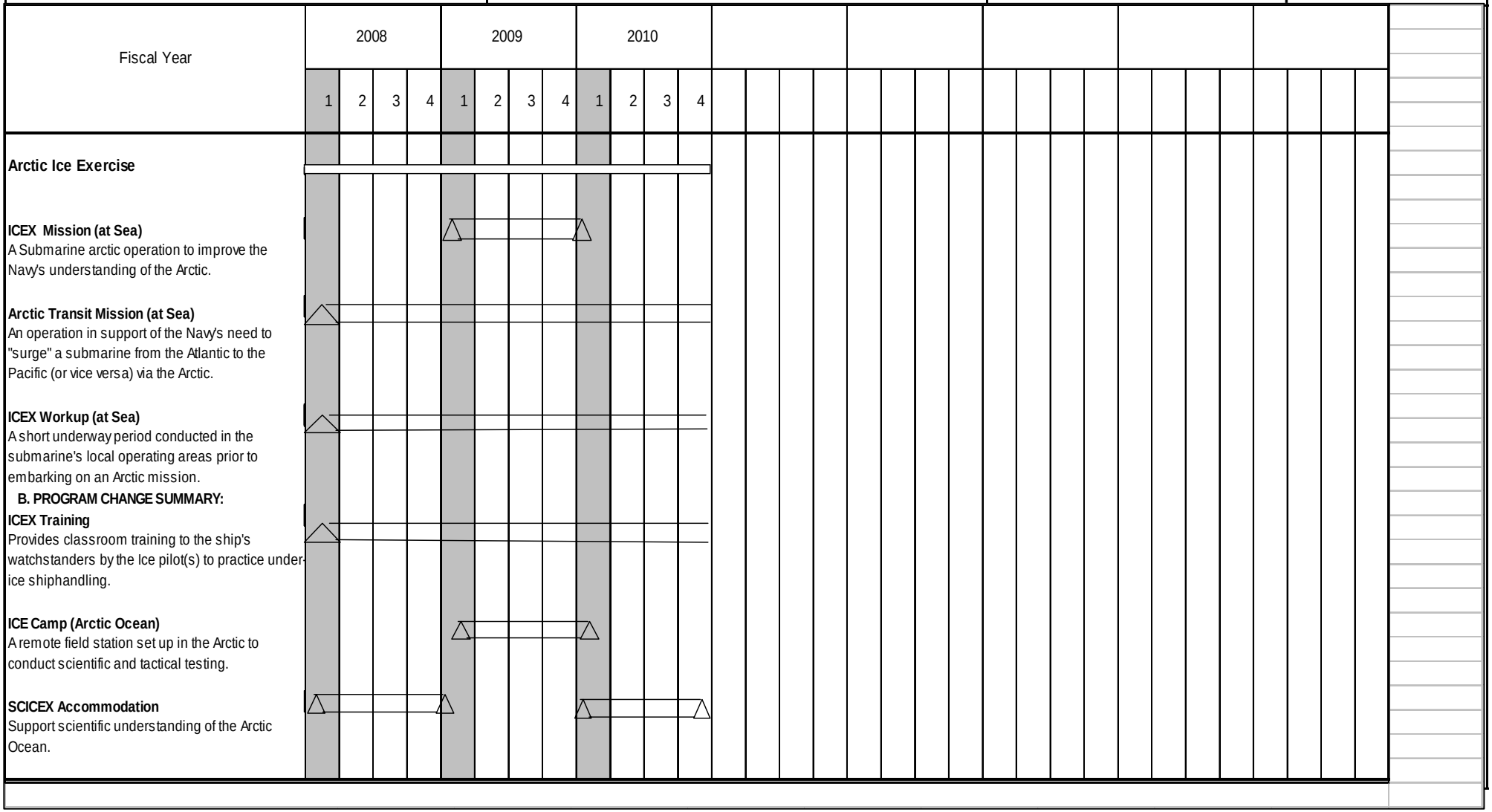
E. MAJOR PERFORMERS:

- Command Submarine Force, US Pacific Fleet (COMSUBPAC), Pearl Harbor, HI
- University of Washington Applied Physics Laboratory (UW/APL), Seattle, WA

Develop and definitize an Arctic-Deploying Side Scan Sonar replacement plan, which will deliver a significant, improved, and qualitative view of the underside of the Ice Canopy Sighting, and tracking of surfaceable features of current submarines, and the VIRGINIA class submarine.

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTI**			PROJECT NUMBER AND NAME **1739/Submarine Arctic W/F Development**					
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			
Developmental Test & Evaluation	WR	SUBDEVRON FIVE, WA	10.427	4.377	OCT-08	4.248	OCT-09			
Developmental Test & Evaluation	C/CPFF	APL/University of Washington	3.150	1.300	OCT-08	1.400	OCT-09			
Subtotal Test and Evaluation			**13.577**	**5.677**		**5.648**				
Remarks:										
Program Management Support	C/CPFF	EG&G, VA	0.153	0.000		0.000				
Program Management Support	C/CPFF	BAE SYSTEMS, MD	0.253	0.140	NOV-08	0.140	NOV-09			
Travel	WR	NAVSEA PEO IWS 5, DC	0.030	0.010	OCT-08	0.010	OCT-09			
Subtotal Management Services			**0.436**	**0.150**		**0.150**				
Remarks:										
Total Cost			**14.013**	**5.827**		**5.798**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	PROJECT NUMBER AND NAME **1739/Submarine Arctic W/F Development**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**			PROJECT NUMBER AND NAME **1739/Submarine Arctic W/F Development**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
ICEX Mission (at Sea)		1Q-4Q					
Arctic Transit Mission (at Sea)	1Q-4Q	1Q-4Q	1Q-4Q				
ICEX Workup (at Sea)	1Q-4Q	1Q-4Q	1Q-4Q				
ICEX Training	1Q-4Q	1Q-4Q	1Q-4Q				
ICE Camp (Arctic Ocean)		1Q-4Q					
SCICEX Accommodation	1Q-4Q		1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603562N/SUBMARINE TACTICAL WARFARE SYSTEMS**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9B79A/Organic Sub ISRT Demo	2.782	0.000	0.000
RDT&E Articles Quantity	0	0	0

The objective of the Organic Submarine Airborne ISRT Demo effort is to design, development and prototyping of Stealthy Affordable Capsule System (SACS) configured for stowage and launch of a UAV. Focus of effort includes Payload Ejection System (PES) that will eject payload from broached SACS capsule and internal SACS support structure and electrical interfaces for UAV application.

	FY 2008	FY 2009	FY 2010
9B78A/High Awareness Littoral Observing (HALO) Sen-360 Degree Imaging Sys	0.965	1.197	0.000
RDT&E Articles Quantity	0	0	0

The objective of the High Awareness Littoral Observing Halo effort is to provide US Navy submarines with Passive Real Time 360 Degree Imaging. The system will contain no moving parts, will provide digital image stabilization and will operate in real time (i.e. minimal delay between event and display). The outboard sensor unit will be compatible with a standard 7.5 inch diameter submarine periscope mast. A graphical user interface (GUI) will provide interaction with the system.

	FY 2008	FY 2009	FY 2010
9B80A/Submarine Targeting Agile Array with Rapid Zooming	1.272	0.000	0.000
RDT&E Articles Quantity	0	0	0

The objective of the Submarine Targeting Agile Array with Rapid Zooming effort is the development of the 360 degree Periscope initiative, near term, in support of Integrated Submarine Imaging System (ISIS) increment three.

	FY 2008	FY 2009	FY 2010
9D37A/Submarine Panoramic Awareness System Program	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

Develop a 360 degree prototype non-rotating periscope in direct support of the Integrated Submarine Imaging System, Digital Periscope for insertion into the pressure vessel in development.

	FY 2008	FY 2009	FY 2010
9D36A/Common Architecture Imaging System (CAIS) Program	0.000	0.798	0.000
RDT&E Articles Quantity	0	0	0

Develop a design approach to migrate the Digital Periscope Optical Sensor package and/or 360 module to PMS435 line of products.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Total PE Cost	39.652	30.970	22.541
2196 / NACT	1.322	1.374	0.681
3161 / NAVSEA Tech Authority	29.436	29.596	21.860
9999 / CONGRESSIONAL ADDS	8.894	0.000	0.000

A. MISSION DESCRIPTION:

Explore alternative surface ship force structures, advanced surface ship & unmanned surface vehicles concepts, and the potential technologies for these force structures and advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, SCN and R&D planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, and the actual conduct of surface ship force structure alternative studies and advanced design concept studies for the ships that may become part of the SCN plan.

(U) Project 2196 - This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are also funded in this project.

(U) Project 3161 - This project funds a broad assortment of initiatives supporting NAVSEA Technical Authority through integrated efforts in Cross Platform Systems Development (CPSD), furthering Sea Enterprise through the development of support elements for Technical Warrant holders and meeting relevant needs of the warfare community. The areas of exploration for CPSD include surface ship concept advanced development, submarine concepts, next generation unmanned surface vehicle, high speed ships and craft, ship engineering and analysis technology center, tool integration and technical data exchange, embedded interoperability engineering, and mission capability system engineering. The research products developed by this project directly influence future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies.

(U) Project 9999: See project description on the R2a.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603563N/SHIP CONCEPT ADVANCED DESIGN**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	39.341	31.111	30.154
FY10 President's Budget	39.652	30.970	22.541
Total Adjustments	0.311	-0.141	-7.613
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0	-0.084	0.000
SBIR/STTR/FTT Assessment	-0.547	0.000	0.000
Program Adjustments	0.858	-0.008	-7.364
Rate/Misc Adjustments	0.000	-0.049	-0.249
Total	0.311	-0.141	-7.613

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**		PROJECT NUMBER AND NAME **2196/NACT**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	1.322	1.374	0.681
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops and explores alternative surface ship force structures, advanced surface ship & unmanned surface vehicles concepts, and the potential technologies for these force structures, along with advanced concepts in support of pre-acquisition mission needs analysis, mission area analysis, and SCN and R&D planning. The objective is a more affordable, mission capable surface ship force including ships with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology. The program directly supports the Navy Shipbuilding Plan with state-of-the-art design tools and methods for surface ship force structure alternative studies, ship & unmanned vehicle concept studies, surface ship mission effectiveness studies, and advanced design concept studies for the ships that may become part of the SCN plan.

(U) This project provides the foundation for an affordable and mission capable surface ship force. It also supports the next step in the development of a transformed naval force by accomplishing the pre-milestone A (especially pre-concept decision) efforts for all potential surface ships and craft. These efforts are the required first step in the integration of total ship systems, including combat systems, weapons systems and Hull, Mechanical and Electrical (HM&E) systems. Inadequate early planning and ship concept formulation can result in down-stream design, construction and operational problems. A more subtle and severely negative impact of neglecting this early effort is that the "best" concepts and technologies may never even be considered and our greatest potential ship design advances never realized. Designs and technologies must meet the threat. This project supports this requirement.

(U) This project funds concept development engineering, mission effectiveness analysis, and other analyses for formulation of future surface ship force structure along with development of the tools to accomplish these efforts. Advanced ship concept studies, ship and ship systems technology assessments, and the development and upgrade of ship concept design and engineering tools, methods, and criteria are also funded in this project.

(U) This project accomplishes the following: (1) Develops alternative surface ship force structure concepts including the ships and unmanned vehicles; (2) Evaluates the mission capability effectiveness and costs for these alternative surface fleet architectures; (3) Performs fleet warfighting/mission effectiveness assessment studies; (4) Identifies future surface ship requirements and characteristics necessary to meet future threats and support mission needs; (5) Investigates new affordable ship concepts and evaluates technologies necessary to support these concepts; (6) Provides design methods and automated design tools to develop and evaluate ship concepts; and (7) Supports development of Initial Capabilities Documents (ICD) and analogous early requirements documents for future ships. These efforts are done to support mission analysis, mission needs development and technology assessment in support of future fleet concepts and potential ship acquisition programs. These efforts are fundamental to the Navy's formulation of the future fleet.

(U) Efforts under Project 2196 transition directly to early stage ship design in PE 0603564N, Ship Preliminary Design and Feasibility Studies, and similar Program Executive Office (PEO) ship design programs. While these efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that supports and maintains this country's naval ship design and engineering capabilities in the area of very early stage (Concept Design) design tools, criteria, and methods.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/NACT**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Ship Concepts and Mission Need Analysis	0.630	0.641	0.486
RDT&E Articles Quantity	0	0	0

U) Ship Concepts and Mission Need Analysis: Develop ship concepts and perform analysis for potential ships and Force Architecture 5-10 years out in SCN plan.
FY08: LSD (X) concept studies; Directed Energy Impacts-Phase 2; Barely Manned Patrol Craft Design; Gap analysis for Expeditionary Strike Force; Competition for New Risk Area Projects.
FY09: Concept designs for Navy Expeditionary Combat Command/Expeditionary Security Force (NECC/ESF) Gap Analysis; Competition for New Risk Area Projects.
FY10: Concept designs for Surface Combatant Anti Submarine Warfare (ASW), Anti Surface Warfare (ASuW) and Maritime Presence Gap Analyses; Competition for New Risk Area Projects.

	FY 2008	FY 2009	FY 2010
Total Ship Technology Assessment	0.058	0.245	0.101
RDT&E Articles Quantity	0	0	0

(U) Total Ship Technology Assessment: Analyze the benefits and impacts of new ship and hull, mechanical & electrical (HM&E) concepts, technologies and warfare systems.
FY08: Support LSD Replacement Analysis of Alternatives (AOA) effort with technology identification using Technology Knowledge Management Systems (TKMS); Competition for New Risk Area Projects.
FY09: Support LSD Replacement Design Team with technical assessment, selection, and monitoring using TKMS; Analyze TKMS needs of T Auxiliary Oiler (TAO) Replacement; Competition for New Risk Area Projects.
FY10: Expand Total Ship Technology Assessment to Auxiliary Tug Fleet Salvage Ship (ATFSS) Design Team with technical assessment, selection, and monitoring using TKMS; Analyze TKMS needs of TAO and LSD Replacement; document technology assessment & insertion instances from ongoing acquisition.

	FY 2008	FY 2009	FY 2010
Ship Concept Design and Engineering Tools, Methods, and Criteria	0.374	0.313	0.044
RDT&E Articles Quantity	0	0	0

U) Ship Concept Design and Engineering Tools, Methods, and Criteria: Improve capability for rapid and accurate ship performance/cost/risk assessments and tradeoff studies.
FY08: ASSET Expanded Capability; Leading Edge Architecture for Prototyping Systems (LEAPS) Composites Analysis (II); LEAPS Distribution System Modeling; LEAPS Applications (Apps)- for Small Craft (II); Competition for New Risk Area Projects.
FY09: Advanced Ship Synthesis Evaluation Tool (ASSET) Expanded Capability; LEAPS Distribution System Modeling (II);LEAPS Apps for Small Craft (III); Competition for New Risk Area Projects.
FY10: Integration and testing of ASSET and LEAPS tools as applied to ongoing and emerging ship concepts. Including synthesis of new hullforms & technologies, emerging combat system concepts, inclusion of concept-level cost analysis.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **2196/NACT**	

	FY 2008	FY 2009	FY 2010
Mission Systems Interface Development and Demonstration	0.260	0.175	0.050
RDT&E Articles Quantity	0	0	0

((U) Mission Systems Interface Development and Demonstration: Requirements development to counter asymmetric, peer and littoral enemies with tailored, modularized mission systems.

FY08: Over the Horizon (OTH) - Unmanned Vehicle test and evaluation; Small combatant/craft stabilized weapon system concept development and ship impact analysis.

FY09: Expeditionary Strike Force modular mission package definition; small combatant in-theater rearming concept development.

FY10: Open-ocean ASW technology insertion analysis.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name of Related RDT&E	FY 2008	FY 2009	FY 2010	Total Cost
(U) PE 0603512N (Carrier Systems Development)	85.742	147.205	173.594	406.541
(U) PE 0603513N (Shipboard Systems Component Development)	42.565	26.824	1.691	71.080
(U) PE 0603564N Ship Preliminary Design/Feasibility Studies	25.611	24.781	28.135	78.527
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	622.812	596.109	0	1218.921
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	61.528	80.869	89.988	232.385
(U) PE 0603582N (Combat Sys Integ/Strike Force Interoperab.	52.316	64.172	22.558	139.046

D. ACQUISITION STRATEGY:

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments.

E. MAJOR PERFORMERS:

Field Activities & Locations - Work Performed:

NSWC Carderock, Bethesda, MD - Future ship open architectures, advanced ship concepts, ship & ship system technology assessments, design & engineering tool upgrades

NSWC Dahlgren, Dahlgren, VA - Future force architectures, mission effectiveness analyses, analytical tool development

Contractors & Locations - Work Performed

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**		PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	29.436	29.596	21.860
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) Mission Description and Budget Item Justification: This project has been established to support NAVSEA Technical Authority through coordinated, collaborative, cross-platform systems development resulting in advanced capabilities across NAVSEA business lines through reuse, adaptation and extension of processes, procedures, and tools necessary to develop and explore alternative surface ship and submarine force structures; advanced submarine concepts, surface ship & unmanned surface vehicle concepts; interoperability; and development of systems level engineering criteria to support these force structures and advanced concepts as part of pre-acquisition mission needs analysis, mission area analysis, SCN, and R&D planning. The objective is the coordination of ongoing early-stage concept design and development efforts for cross-platform applicability to result in a more affordable, mission-capable, and interoperable surface ship and submarine forces including ships and submarines with reduced manning, increased producibility, reduced operating and support costs, and greater utilization of the latest technology.

(U) Efforts under Project 3161 enhance ongoing efforts within Project 2196 and transition directly to early-stage ship design for Ship and Submarine Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship and submarine design programs. While these efforts support concept exploration and mission needs assessment for potential future ship and submarine acquisition programs, they are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort (Government or commercial) that provides a coordinated, collaborative approach to the development of cross-platform naval ship, submarine, and weapon system design and engineering capabilities in the areas of design tools, criteria, and methods. This project also provides innovative solutions for current Fleet issues involving Technical Authority, such as current interoperability issues with new systems or platforms.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Ship Concept Advanced Development	2.555	2.504	1.900
RDT&E Articles Quantity	0	0	0

(U) Ship Concept Advanced Development: Directly supports the Navy's ability to understand risk and ROM cost of surface warfare assets; Pre-Milestone A ship and craft design and analysis. (CPSD 1)

FY08: Friction Stir Welding of Al for Naval Applications; Future Expeditionary Warfare Concept Study; Unmanned Carrier Air Vehicles (UCAV) Ship Support Study; High Speed Open Ocean Phase 2; Competition for New Risk Area Projects

FY09: Friction Stir Welding of Al for Naval Applications phase 2; Future Expeditionary Warfare Concept Designs; UCAV Ship Support Study Phase 2; Competition for New Risk Area Projects.

FY10: Complete Future Expeditionary Warfare Concept Study; Develop future surface combatant concept options incorporating emerging combat system, propulsor/propulsion, powering, and modular architectures; develop future auxiliary concepts including replenishment and fleet support; develop green/brown water support and presence concepts in context of maritime strategy; examine common cross-platform architectures, interfaces, and modular approaches to leverage common mission capability and achieve producibility efficiencies; develop High Speed Open Ocean concepts leveraging results of ongoing technology development; Competition for New Risk Area Projects

	FY 2008	FY 2009	FY 2010
Ship Design and Certification Tools and Technical Data Exchange	2.757	2.728	2.066
RDT&E Articles Quantity	0	0	0

(U) Ship Design and Certification Tools and Technical Data Exchange: Evaluation tools to certify the safety and mission capability of ships and submarines. Integrated strategy for NAVSEA suite used to support of ship certs. (CPSD 2)

FY08: Extend tools and ship model integration (M&S) supporting Fleet Incident Situational Response program. Extend and integrate modeling & simulation tools supporting Live Fire Test & Evaluation (LFT&E). Competition for New Risk Area Projects.

FY09: Extend and integrate analytical tools supporting high performance naval ship technologies. Demo tech data exchange between LFT&E M&S environment and shipbuilder CAD environments; Extend M&S integrated environmental to additional engineering disciplines. Competition for New Risk Area Projects.

FY10: Continue integration of analytical tools supporting high performance naval ship technologies. Continue assessment of data exchange standards between LFT&E M&S and shipbuilder CAD environments; begin certification process. Continue expansion of M&S integrated environment to additional engineering disciplines. Coordinate data development and data exchange requirements to minimize data regeneration and modification efforts between disciplines and support reuse through design and acquisition process.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

	FY 2008	FY 2009	FY 2010
Advanced Ship Systems Development	2.659	2.677	1.989
RDT&E Articles Quantity	0	0	0

(U) Advanced Ship Systems Development: Develop and validate advanced tools and processes to reduce technical risk to naval platform acquisition programs in support of naval Technical Authority (CPSD 3).

FY08: Continue development and validation of Full Ship Finite Element Modeling Baseline; Expand development of Acoustic Spectrum Management Tools for Surface Ships capabilities and resolution; Initiate platform ballasting and deballasting design tool studies. Initiate Open Systems Architecture Baseline Combat System Studies for transition into new acquisition platforms and in-service ship upgrades.

FY09: Validate Future Fleet Engineering Systems and Service Life Studies; Continue development and validation of Full Ship Finite Element Modeling Baseline and expand resolution for damage control assessment; Continue platform ballasting and deballasting design tool studies; Validate ship system commercial design tools for advanced material handling and machining.

FY10: Expand Full Ship Finite Element Modeling Baseline and expand resolution into survivability, vulnerability and recoverability analyses. Incorporate integrated topside design tool set and methodologies. Expand Cost Analysis modeling & simulation via improved cost estimating relationships that include concepts of equipment density and fabrication complexity. Articulate developing combat system architectures in terms of ship system impacts and cost. Include emerging power and propulsion system architectures into Modeling Baseline.

	FY 2008	FY 2009	FY 2010
Next Generation USV	1.791	1.779	1.325
RDT&E Articles Quantity	0	0	0

(U) Next Generation USV: Development and demonstration of Unmanned Surface Vehicle (USVs) with focus on autonomous behavior, modularity, new ship classes for pre Alternative of Analysis (AoA) studies. (CPSD 4)

FY08: Rapidly Deployable MUTE USV Prototype; Payload Power Support Prototype; Long Range Endurance design; Autonomous Health Monitoring and Recovery design; Competition for New Projects.

FY09: Long Range Endurance prototype; Autonomous Health Monitoring and Recovery prototype; Competition for New Risk Area Projects.

FY10: Conduct operational assessment of Long Range Endurance prototype and Autonomous Health Monitoring and Recovery prototype; continue development of USV interoperability concepts and architectures; development of open architecture & modular system and technical architectures for USV operations aboard manned and unmanned surface combatants; Competition for New Risk Area Projects.

	FY 2008	FY 2009	FY 2010
High Speed Ships and Craft	3.200	3.226	2.405
RDT&E Articles Quantity	0	0	0

(U) High Speed Ships and Craft: Investigate concepts for future high speed ships and craft that promise improved mission effectiveness in mobility, survivability, and warfare mission areas. (CPSD 5)

FY08: High Speed Advanced Actuators design and prototype construction; Plant architecture systems engineering process integration into Naval Vessel Rules (NVR); Competition for New Risk Area Projects

FY09: Drag Reduction Transition to fleet demonstrator; AWJ-21 design tool validation and NVR integration; Competition for New Risk Area Projects.

FY10: High Speed Ships tools, guidelines, validation data sets and training: High speed human systems (trials, testing, numeric modeling, guidelines for early stage design). Light weight "Structures cooperative research with NATO partners. Light Weight Structures Shock (Helsinki Class) Shock Trial.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	

	FY 2008	FY 2009	FY 2010
Alternative Power Systems	3.001	3.027	2.252
RDT&E Articles Quantity	0	0	0

(U) Alternative Power Systems: Investigate concepts for ships and craft with alternative power/propulsion systems evaluating effectiveness in mobility, survivability, and warfare mission areas. (CPSD 6)
FY08: Fuel Cell At Sea Demonstration design; Rim Driven Ducted Propulsor design; Competition for New Risk Area Projects
FY09: Fuel Cell At Sea Demonstration prototype construction; Rim Driven Ducted Propulsor prototype construction; Competition for New Risk Area Projects.
FY10: Alternate propulsion tools, guidelines, validation data sets and training: Extreme wave modeling cooperative research project with NATO partners. Hydrodynamics force and moment modeling supporting dynamic stability simulation. Next Generation Integrated Propulsion systems architecting, survivability and propulsor.

	FY 2008	FY 2009	FY 2010
Ship Engineering & Analysis Technology Center	1.231	1.207	0.898
RDT&E Articles Quantity	0	0	0

(U) Ship Engineering & Analysis Technology Center (formerly Hydrodynamic/Hydroacoustic Technology Center (H/HTC)): Provides Government activities, shipbuilders, academia and contractors the following:
FY08-FY09: high performance computing systems; commercial and research software libraries; classified and unclassified connectivity; high end data visualization; and collaboration tools/Centralized data repository. Provide the framework of continued world class computing upon which specific task funding will build. (project 2196 in FY06) (CPSD 7)
FY10: Expand high performance computing system efforts; leveraging commercial and research software and connectivity. Develop security, visualization and collaborative processes to leverage common centralized data storage. Conduct hydrodynamic analyses of emerging ship and craft concepts in various mission performance and geographic regimes. Conduct airwake analysis of emerging high-speed ship concepts including impact of modular mission and payload architectures and configurations.

	FY 2008	FY 2009	FY 2010
Future Submarine Design	3.904	3.921	2.944
RDT&E Articles Quantity	0	0	0

(U) Future Submarine Design: Develop ship concept studies and evaluate technologies to define the Next Generation Submarine, common SSN-SSBN Hull and Payload Modularity. (CPSD 8)
FY08: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - phase 3; Submarine Design Processes and Standards Development
FY09: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - phase 4; Submarine Design Processes and Standards Development.
FY10: Navy After Next Tech Validations; Technical Warrant Holder Concept Validation Support; SUBCODE Concept Design Tool Dev - integration and testing phase; Submarine Design Processes and Standards Development; next generation submarine concept exploration; modular payload and interface concept development.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**	

	FY 2008	FY 2009	FY 2010
Embedded Interoperability (I/O) Engineering	4.078	4.160	3.081
RDT&E Articles Quantity	0	0	0

(U) Embedded Interoperability (I/O) Engineering: Establishes and executes a dedicated process for evaluating the interoperability performance of warfare systems early in the acquisition cycle, prior to certification. Embedded I/O ensures that fewer mission critical system failures degrade the ultimately fielded warfighting capability. Focus on emerging Open Architecture warfare systems. (CPSD 9)

FY08: Develop Tactics, Techniques & Procedures (TTP) for LPD 18; pre-certification for the interoperability test and assessment of CVN 77, CVN 73,LHD 7, DDG Modernization and DDG 1000. Enhance BFIMS capabilities.

FY09: Develop TTP for CVN 77 and DDG Modernization based on FY 08 work; pre-certification for the interoperability test and assessment of LCS 1 & 2, CG Modernization, DDG 1000 and CVN 21 (CVN 78). Develop TTP for LCS 1 & 2 based on FY 09 work.

FY10: Complete development of TTP for CVN 77 and DDG Modernization; continue pre-certification for the interoperability test and assessment of LCS, CG Modernization, DDG 1000 and CVN 21 (CVN 78); complete interoperability efforts LPD 17 (class); complete TTP for LCS 1 & 2; continue interoperability planning for CG(X).

	FY 2008	FY 2009	FY 2010
Mission Capability Systems Engineering	4.260	4.367	3.000
RDT&E Articles Quantity	0	0	0

(U) Mission Capability Systems Engineering: Develop force level systems engineering criteria and guidance at the Systems of Systems (SoS) and Family of Systems (FoS) level. (CPSD 10)

FY08 and beyond: Continue to provide technical standards, definitions and requirements for National Security Systems (NSS), integrated architecture views for warfare systems of systems, independent technical analysis of warfare systems design and development options and the development of technical artifacts and associated products required by applicable source references by using specially selected Technical Authority Warrant Holders.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
(U) Related RDT&E				
(U) PE 0603512N (Carrier Systems Development)	85.742	147.205	173.594	406.541
(U) PE 0603513N (Shipboard Systems Component Development)	42.565	26.824	1.691	71.080
(U) PE 0603564N Ship Preliminary Design/Feasibility Studies	25.611	24.781	28.135	78.527
(U) PE 0604300N (SC21 Total Ship Systems Engineering)	622.812	596.109	0	1,218.921
(U) PE 0604567N (Ship Contract Design/Live Fire T&E)	61.528	80.869	89.988	232.385

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

D. ACQUISITION STRATEGY:

This is a non acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship and submarine acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments. This program supports the NAVSEA Technical Warrant Holders by providing validated engineering tools, methods, and criteria for ship, submarine and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

E. MAJOR PERFORMERS:

Field Activities & Locations - Work Performed:

NSWC Carderock, Bethesda, MD - Future ship open architectures, advanced ship concepts, ship & ship system technology assessments, design & engineering tool upgrades

NSWC Dahlgren, Dahlgren, VA - Future force architectures, mission effectiveness analyses, analytical tool development

SPAWAR, San Diego, CA - C4ISR systems concept development & integration

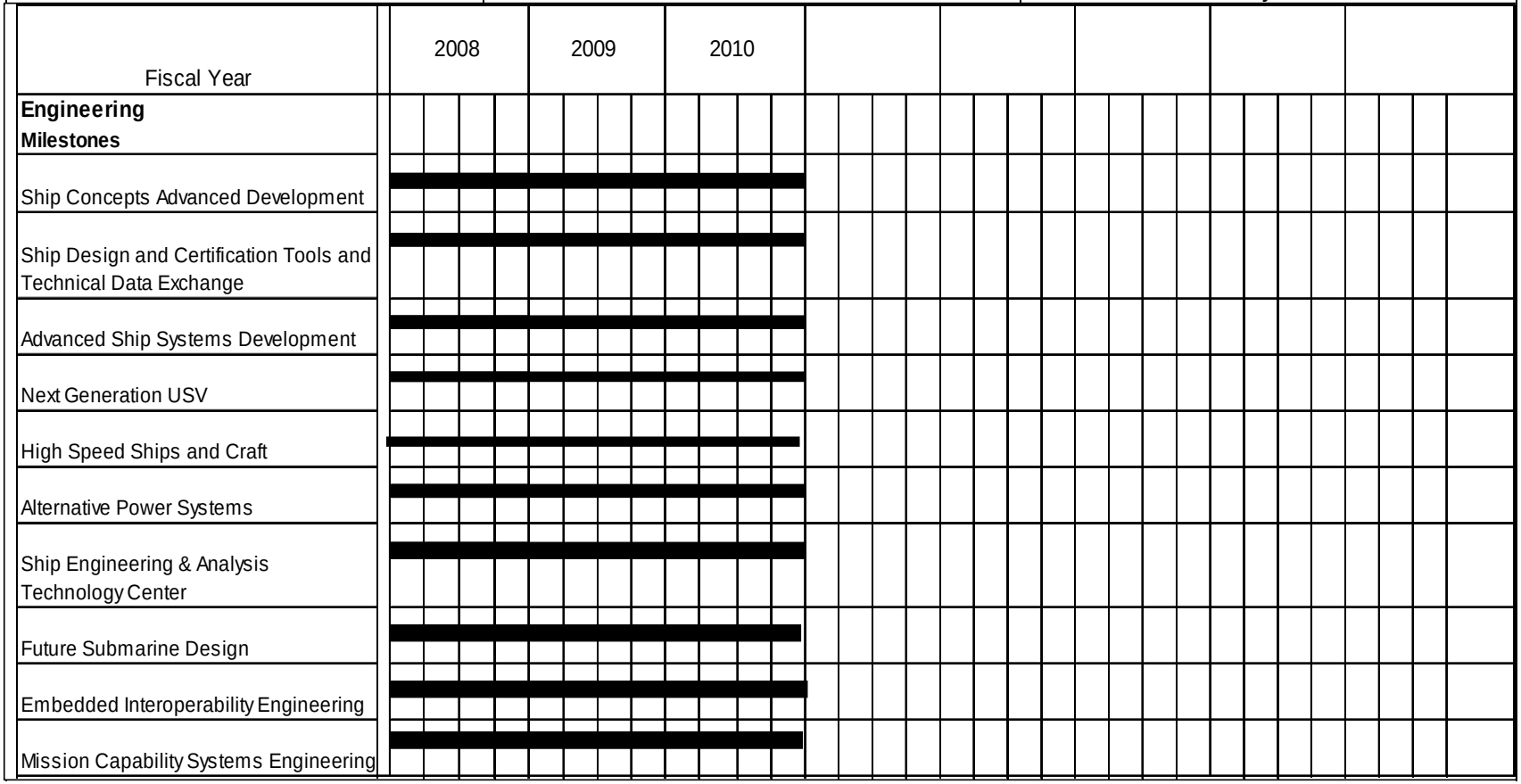
Contractors & Locations - Work Performed

TBD - Systems engineering analyses, trade studies, ship concept design, cost impact analysis

TBD - Software, tools development

CLASSIFICATION:	UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**			PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**				
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
Systems Engineering	various	Various Contractors	5.275	2.513	Jan/Feb-09	1.864	Dec-09	9.652	0.000
Systems Engineering	WR	NSWC, NUWC, CDSA	13.265	11.094	Jan-09	8.097	Dec-09	32.456	0.000
Engineering Development	WR	NSWC, NUWC	12.969	11.463	Jan-09	8.441	Dec-09	32.873	0.000
Demonstration & Evaluation	WR	NSWC	5.683	4.324	Jan-09	2.664	Dec-09	12.671	0.000
	WR	SPAWAR	1.600	0.102	Mar-09	0.694	Dec-09	2.396	0.000
Subtotal Product Development			**38.792**	**29.496**		**21.760**		**90.048**	**0.000**
Remarks:									
Subtotal Support Costs			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**
Remarks:									
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**
Remarks:									
Travel			0.200	0.100		0.100		0.400	0.000
Subtotal Management Services			**0.200**	**0.100**		**0.100**		**0.400**	**0.000**
Remarks:									
Total Cost			**38.992**	**29.596**		**21.860**		**90.448**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**



CLASSIFICATION:	UNCLASSIFIED			
EXHIBIT R-4a, SCHEDULE DETAIL				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**			PROJECT NUMBER AND NAME **3161/NAVSEA Tech Authority**

Schedule Profile	FY 2008	FY 2009	FY 2010
Cross Platform Systems Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Concepts Advanced Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Design and Certification Tools and Technical Data Exchange	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Advanced Ship Systems Development	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Next Generation USV	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
High Speed Ships and Craft	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Alternative Power Systems	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Ship Engineering & Analysis Technology Center	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Future Submarine Design	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Embedded Interoperability Engineering	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
Mission Capability Systems Engineering	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603563N/SHIP CONCEPT ADVANCED DESIGN**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9816A/Autonomous Maritime Navigation Program	4.639	0.000	0.000
RDT&E Articles Quantity	0	0	0

U) Autonomous Maritime Navigation Program - AMN involves development of sensor fusion processing; development of automated data interpretation processing; development of intelligent autonomy and control , integration of these components into a fully autonomous dynamic navigation planning and operations capability, and integration into Navy test craft for system maturing and testing. System by design will be portable to other military platforms, both unmanned and manned, to enable very high levels of autonomous operations to reduce manpower requirements and improve both war fighter safety and conditions.

	FY 2008	FY 2009	FY 2010
9992A/Scout Radar Stealth Upgrades for Special Warfare Crafts	0.968	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) Scout Radar Stealth Upgrades for Special Warfare Crafts - To further refine the initial process of converting a Low Probability of Intercept (LPI) Radar with a six foot scanner to a LPI Radar with a smaller scanner capable of being used on Combatant Craft (small boats).

	FY 2008	FY 2009	FY 2010
9B81A/Advanced Video Processing Technologies (AVPT)	0.964	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) This congressional add will fund the research, development and evaluation of advanced video sensor and processing technologies that can mitigate the bandwidth required to efficiently transfer video imagery off the ship to subject matter experts ashore. This technology will provide the capability to transfer bandwidth intensive video information via existing ship to shore communications networks which currently have limited bandwidth.

	FY 2008	FY 2009	FY 2010
98B2A/Low-Signature Modular Weapon Platform	2.323	0.000	0.000
RDT&E Articles Quantity	0	0	0

(U) This effort will support the seal delivery vehicle (SDV) as technology demonstrators to explore enhanced sea keeping performance, payload modularity, integrated command and control, advanced construction techniques, reliability and maintainability. This task will conduct a craft survey and report of the Sealion I vessel and extend the length of Sealion I to mirror Sealion II.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	25.611	24.781	28.135				
0408 / Ship Development (Adv)	3.432	4.537	1.463				
3127 / Sea Base to Shore Connectors (Concept Stud)	12.792	0.000	0.000				
3195 / JCC(X)	1.954	10.032	25.190				
3226 / Green Water Craft	0.000	0.000	1.482				
9993A / Support For Naval Ship Hydrodynamic Test Facilities	4.820	3.989	0.000				
9D39A / Bow Lifting Body Ship Research	0.000	6.223	0.000				
9B83A / Common Composite Island Concept	2.613	0.000	0.000				

A. MISSION DESCRIPTION:

0408 SURFTECH - Ship Development project supports the evaluation of advanced and alternative technologies through the Surface Ship Technology (SURFTECH) process for suitability for meeting total ship concepts capability needs.

3127 - Sea Base to Shore Connectors (Concept Studies) is intended to provide the functional replacement for the Landing Craft Air Cushion (LCAC) whose SLEP extended service life ends beginning in 2014. It will provide the surface assault portion of the Joint Expeditionary Maneuver Warfare tactical solution set requirement.

3195 - JCC(X) is a mobile, self-sustaining platform (that may be based on the LPD 17 hull form) with robust C4ISR capability for a Joint Force Commander and staff and provides in-theater command and control should a land-based headquarters be unavailable, constrained or threatened. RDT&E profile supports necessary preliminary efforts in order to award detail design and procurement contract.

3226 - Green Water Craft which will provide maritime security and stability operations and increased maritime domain awareness in compliance with Global Maritime Security

9993A - Support for Naval Ship Hydrodynamic Test Facilities replaces the wavemakers in the MASK basin with modern systems capable of supporting Navy needs.

9D39A - Bow Lifting Body Ship Research project will develop and transition lifting body technologies to support future acquisition programs that consider single hull configurations.

9B83A - Common Composite Island Testing is funded to conduct a study to identify opportunities for composites on an LHA island, assess opportunities for commonality between LHA and CVN islands, and develop a suitable composite material system for use on both platforms.

objectives and in direct support of Global Fleet Stations (GFS). Funding will provide for craft feasibility and sizing study and subsystem Mockups in support of initial craft production.

9993N Support for Naval Ship Hydrodynamic Test Facility, Bow Lifting Body Ship Research and the Common Composite Island Concept are Congressional Adds

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	25.987	14.627	26.717
FY10 President's Budget	25.611	24.781	28.135
Total Adjustments	-0.376	10.154	1.418
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	10.173	0.000
SBIR/STTR/FTT Assessment	-0.372	0.000	0.000
Program Adjustments	-0.004	0.000	1.412
Rate/Misc Adjustments	0	-0.019	0.006
Total	-0.376	10.154	1.418

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**				PROJECT NUMBER AND NAME **0408/Ship Development (Adv)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	3.432	4.537	1.463				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project unit supports two efforts.

SURFTECH - The evaluation of advanced and alternative technologies through the Surface Ship Technology (SURFTECH) process for suitability for meeting total ship concepts capability needs. The objective of this project is to provide the decision makers with feasible, affordable alternatives to be selected for further development.
In support of surface ship advanced technology development and transformation, the surface ship community has instituted a technology evaluation process to coordinate, identify, prioritize, and integrate technology insertion and development efforts and assist RDT&E community efforts to initiate appropriate technology development. The current acquisition guidelines require the development of critical technologies after Milestone A. If significant gap analysis, planning, and early development efforts are not conducted in parallel with Concept Development the Navy will not be able to provide broad, cross-platform direction to surface navy development efforts in an effective manner and will not effectively leverage limited resources to quicken the pace of both development and transition of critical mission technologies for timely acquisition.

AGOR OCEAN - Funding supports the acquisition of general purpose research vessels which will conduct science, educational and engineering operations in all oceans, and will be operated by the University Oceanographic Laboratory System (UNOLS).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **0408/Ship Development (Adv)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Ocean Class AGOR	2.993	3.989	0.971
RDT&E Articles Quantity	0	0	0

OCEAN Class AGOR:

RDT&E profile supports necessary preliminary efforts in order to award detail design and procurement contract.

	FY 2008	FY 2009	FY 2010
SURFTECH	0.439	0.548	0.492
RDT&E Articles Quantity	0	0	0

SURFTECH:

As new ship concepts with desired mission capabilities are developed, SURFTECH will continuously identify, prioritize, and integrate technology insertion and development efforts and assist the RDT&E community efforts to initiate appropriate technology development. SURFTECH will provide continuous analysis of and feedback to ongoing technology development efforts to ensure project relevance and timely transition to meet acquisition schedules, which will be documented in the Technology Plan.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

OCEAN Class AGOR:

Phased acquisition strategy to support procurement of ocean research vessels. Firm Fixed price (FFP) type contract will be awarded.

E. MAJOR PERFORMERS:

Ocean Class AGOR:

Field Activities & Locations - Work Performed:

NSWC, Carderock, MD - Concept development and engineering support

NAVO Stennis Space Center, MS - Concept development and engineering support

Contractors & Locations - Work Performed:

Computer Sciences Corporation, Washington, DC - Engineering Support

ALION-JJMA, Washington, DC - Program Support

Universities & Locations - Work Performed: N/A

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**					PROJECT NUMBER AND NAME **0408/SHIP DEVELOPMENT (ADV)**					
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
Contract/Functional Design (Ocean Class AGOR)	FFP	TBD	0.000			3.000	AUG-09	0.000			3.000	0.000
Subtotal Product Development			**0.000**			**3.000**		**0.000**			**3.000**	**0.000**
Remarks:												
Integrated Logistics (SURFTECH)	Various	Various	0.196			0.100	JAN-09	0.100	JAN-10		0.496	0.000
Configuration Mngt (SURFTECH)	Various	Various	0.709			0.389	JAN-09	0.400	JAN-10		1.817	0.000
Subtotal Support Costs			**0.905**			**0.489**		**0.500**			**2.313**	**0.000**
Remarks:												
Subtotal Test and Evaluation			**0.000**			**0.000**		**0.000**			**0.000**	**0.000**
Remarks:												
Contractor Engineering Support (Ocean Class AGOR)	MAC	CSC	1.195			0.350	MAR-09	0.300	JAN-10		1.845	0.000
Government Engineering Support (Ocean Class AGOR)	WX	Various	0.180			0.075	MAR-09	0.150	JAN-10		0.405	0.000
Program Management Support (Ocean Class AGOR)	MAC	Alion/JJMA	1.570			0.532	MAR-09	0.410	JAN-10		2.512	0.000
Travel (Ocean Class AGOR)	PD	NAVSEA	0.048			0.032	MAR-09	0.040	JAN-10		0.168	0.000
Program Management (SUFFTECH)	Various	Various	0.076			0.059	MAR-09	0.063	JAN-10		0.218	0.000
Subtotal Management Services			**3.069**			**1.048**		**0.963**			**5.148**	**0.000**
Remarks:												
Total Cost			**3.974**			**4.537**		**1.463**			**10.461**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **0408/SHIP DEVELOPMENT (ADV)**

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
SURFTECH												
Concept/Tech Development Analysis		Ongoing Concept/Tech Development Analysis										
Technology Plan Updates		△				△				△		
OCEAN CLASS AGOR												
Acquistion Milestones												
Phase I RFP Release							△					
Phase I Award								△				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**			PROJECT NUMBER AND NAME **0408/SHIP DEVELOPMENT (ADV)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Ocean Class AGOR - Phase I RFP Release		3Q					
Ocean Class AGOR - Phase I Award		4Q					
SURFTECH Concept /Tech Development Analysis	1Q-4Q	1Q-4Q	1Q-4Q				
SURFTECH Technology Plan Updates	2Q	2Q	2Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**				PROJECT NUMBER AND NAME **3127/Sea Base to Shore Connectors (Cncpt Stud)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	12.792	0.000	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provide a 30 year craft for the 2015 and beyond time frame, a high speed, over the beach, ship-to-shore amphibious capability to lift all equipment organic to the ground elements of a Marine Air/Ground Task Force and provide other assault and non-assault (humanitarian, etc.) operations from the sea. Provides the functional replacement for Landing Craft Air Cushion whose SLEP extended service life ends beginning in 2014. Future funding for later phases of the Seabase to Shore Connector Program is included in PE 0604567, Project Unit 3133.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **3127/Sea Base to Shore Connectors (Cncpt Stud)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	12.792	0.000	0.000
RDT&E Articles Quantity	0	0	0

Prepared for and participated in Milestone A Review in FY08. Start preparation of Capability Development Document (CDD) in FY 08 to complete in FY10. The CDD outlines an affordable increment of militarily useful, logistically supportable and technically mature capability. Preliminary Design efforts began in FY08 and are scheduled to complete in FY09 followed by a Milestone (MS) A Defense Acquisition Board Review.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010					To Complete	Total Cost
SCN 0204411N Surface Connector (55112)	0.000	0.000	0.000					0.000	0.000
RDT&EN 0604567 Sea Base Connector (3133)	14.199	26.154	36.054					0.000	76.407

D. ACQUISITION STRATEGY:

The lead craft will be procured and constructed with RDT&E funds with follow crafts procured and constructed with SCN funds. The lead craft Detail Design contract will include an option for construction.

E. MAJOR PERFORMERS:

Field Activities & Locations - Work Performed
NSWC Carderock Division, Philadelphia, PA - Systems Engineering for Propulsion Systems
NSWC Panama City Division, Panama City, FL - Systems Engineering for Hull, Mechanical & Electrical
NUWC Keyport, Keyport, FL - Systems Engineering for Command and Control

Contractors & Locations - Work Performed
Textron Marine & Land Systems, New Orleans, LA - SSC Concept Study & Skirt Technology
Rolls-Royce, Walpole, MA - Marine Gas Turbine
Goodrich, Jacksonville, FL - Composite Fan propulsor Assembly
NG Electric Systems, Sunnyvale, CA - Integrated Power Systems and Mechanical Drive Options
Umoe Mandal, Virginia Beach, VA - Concept Study & Fiber Reinforced Plastic
Alion Science and Tech, Chicago, IL - Hybrid ACV Propulsion

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **3127/Sea Base to Shore Connectors (Cncpt Stud)**

Technology Systems Inc., Brunswick, MA - Augmented Reality Visualization

Universities & Locations - Work Performed

Penn State ARL, State College, PA - Maintenance Network

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**				PROJECT NUMBER AND NAME **3195/JCC(X)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.954	10.032	25.190				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(3195) JCC(X) is a mobile, self-sustaining platform (that may be based on the LPD 17 hull form) with robust C4ISR capability for a Joint Force Commander and staff and provides in-theater command and control should a land-based headquarters be unavailable, constrained or threatened.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **3195/JCC(X)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.954	10.032	25.190
RDT&E Articles Quantity	0	0	0

Funds JCC(X) requirements documentation and other JCC(X) preliminary design and feasibility study efforts necessary to obtain a Program Decision to proceed with start of functional designs in FY 2009.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010					To Complete	Total Cost
BLI: 5521500 (JCC(X) SCN)	0.00	0.00	0.00						0.000

D. ACQUISITION STRATEGY:

E. MAJOR PERFORMERS:

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**					PROJECT NUMBER AND NAME **3195/JCC(X)**			
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	Cost to Complete ($000)	Total Cost ($000)	Target Value of Contract
Prelim Design & Feasibility Studies	VARIOUS	VARIOUS	1.954	10.032		25.190		0.000	35.222	0.000
Subtotal Product Development			**1.954**	**10.032**		**25.190**		**0**	**35.222**	**0.000**
Remarks:										
Subtotal Support Costs			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**	**0.000**
Remarks:										
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**	**0.000**
Remarks:										
Subtotal Management Services			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**	**0.000**
Remarks:										
			0.000	0.000		0.000		0.000	0.000	0.000
Subtotal Ship Preliminary Design & Feasibility Studies to achieve JCC(X) Acquisition			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**	**0.000**
Remarks:										
Total Cost			**1.954**	**10.032**		**25.190**		**0**	**35.222**	**0.000**

EXHIBIT R4, Schedule Profile																															
Date: May 2009																															
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME																		
RDTEN/BA-4	**PE 0603564N/SHIP PRELIM DESIGN & FEASIBILITY STUDIES**												**3195 JCC(X)**																		
Fiscal Year	2008				2009				2010																						
	1	2	3	4	1	2	3	4	1	2	3	4																			
JCC(X) Ship Preliminary Design & Feasibility Studies to achieve JCC(X) Acquisition Milestones																															
Concept Decision				△																											
MS A								△																							

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**			PROJECT NUMBER AND NAME **3195/JCC(X)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Concept Decision	4Q						
MS A		4Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**				PROJECT NUMBER AND NAME **3226/Green Water Craft**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	1.482				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Green Water Craft which will provide maritime security and stability operations and increased maritime domain awareness in compliance with Global Maritime Security objectives and in direct support of Global Fleet Stations (GFS). Funding will provide for craft feasibility and sizing study and subsystem Mockups in support of initial craft production.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **3226/Green Water Craft**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	1.482
RDT&E Articles Quantity	0	0	0

In support of initial craft production, Government and contractor engineering support will conduct craft feasibility and sizing studies to be used to develop Command and Control System and Pilot House Static Mockups.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable

D. ACQUISITION STRATEGY:
Not applicable

E. MAJOR PERFORMERS:
Not applicable

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**					PROJECT NUMBER AND NAME **3226/Green Water Craft**					
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			
Craft Sizing Study	FPP	TBD	0.000	0.000		0.300	NOV-09	0.300	0.000			
Command and Control Mockup Design and Prototype Development	FPP	TBD	0.000	0.000		0.850	NOV-09	0.850	0.000			
Pilot House Static Mockup	FPP	TBD	0.000	0.000		0.000		0.000	0.000			
Subtotal Product Development			**0.000**	**0.000**		**1.150**		**1.150**	**0.000**			
Remarks:												
Subtotal Support Costs			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**			
Remarks:												
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**			
Remarks:												
Contractor Engineering Support (Green Water)	MAC	CSC	0.000	0.000		0.070	NOV-09	0.070	0.000			
Government Engineering Support (Green Water)	WX	NSWCCD CCD	0.000	0.000		0.222	NOV-09	0.222	0.000			
Travel (Green Water)	PD	NAVSEA	0.000	0.000		0.040	DEC-09	0.040	0.000			
Subtotal Management Services			**0.000**	**0.000**		**0.332**		**0.332**	**0.000**			
Remarks:												
Total Cost			**0.000**	**0.000**		**1.482**		**1.482**	**0.000**			

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET A(**RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN&FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **3226/Green Water Craft**

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Green Water Craft Sizing Study Award									△			
Command and Control Mockup Award									△			
Green Water Craft Sizing Study Delivery											△	

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES**			PROJECT NUMBER AND NAME **3226/Green Water Craft**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Green Water Craft Sizing Study Award			1Q				
Command and Control Mockup Award			1Q				
Green Water Craft Sizing Study Report			3Q				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE MAY 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA**	PROGRAM ELEMENT NUMBER AND NAME **0603564N/SHIP PRELIM. DESIGN & FEASIBILITY STUDIES**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010	
9993A/Support For Naval Ship Hydrodynamic Test Facilities	4.820	3.989	0.000	
RDT&E Articles Quantity	0	0	0	

(U) This funding supports the Naval Ship Hydrodynamics Test Facilities.

	FY 2008	FY 2009	FY 2010	
9D39A Bow Lifting Body Ship Research	0.000	6.223	0.000	
RDT&E Articles Quantity	0	0	0	

(U) The Bow Lifting Body project will develop and transition lifting body technologies to support future acquisition programs that consider single hull configurations. Lifting body technology permits ships and water borne craft to elevate relative to the stationary buoyant condition of the ship. The elevation permits ships and craft outfitted with lifting body technology to reduce contact the sea surface reducing ship resistance and permitting greater operability in certain wind and wave conditions relative to ships and craft of similar size not outfitted with lifting body technology.

	FY 2008	FY 2009	FY 2010	
9B83A Common Composite Island Testing	2.613	0.000	0.000	
RDT&E Articles Quantity	0	0	0	

(U)This project is funded to conduct a study to identify opportunities for composites on an LHA island, assess opportunities for commonality between LHA and CVN islands, and develop a suitable composite material system for use on both platforms.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	1.555	9.175	5.599				
2471 / Integrated Power Systems (IPS)	0.000	0.000	5.599				
9999 / Congressional Add	1.555	9.175	0.000				

A. MISSION DESCRIPTION:

The Integrated Power System (IPS), Project 2471, was previously budgeted in RDTEN PE 0603513N for FY2008 & FY2009.

The Electric Ship Office (ESO) is responsible for developing and executing the Next Generation IPS (NGIPS) technology development and transition plan. The ESO's initial efforts are to coordinate the ongoing electric power efforts of the PEOs and Office of Naval Research, establishing the technical basis and strategic direction for Naval power system architectures, developing decision making tools, and establishing technical standards.

This PE funds the development of specific and future electric ship technologies for surface combatants family of ships, such as DDG 1000 and CG(X) with focus on the Integrated Power System which provides total ship electric power, including electric propulsion, power conversion and distribution, combat system and mission load interfaces to the electric power system.

The following Congressional Adds are included in this budget:

FY08:

9971A Advanced Combatant Materials Research

FY09:

9807A Smart Machinery Spaces Systems

9B82A Low Signature Modular Weapon Platform

9D38A Analytics for Shipboard Monitoring Systems

9D40A Ship Affordability through Advanced Aluminum Structures.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	1.590	0.000	0.000
FY10 President's Budget	1.555	9.175	5.599
Total Adjustments	-0.035	9.175	5.599
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	9.175	0.000
SBIR/STTR/FTT Assessment	-0.035	0.000	0.000
Program Adjustments	0.000	0.000	5.678
Rate/Misc Adjustments	0.000	0.000	-0.079
Total	-0.035	9.175	5.599

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

IPS is a candidate system for DDG 1000, CG(X), and other surface combatants.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**				PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	5.599				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Integrated Power System (IPS), Project 2471, was previously budgeted in RDTEN PE 0603513N for FY2008 & FY2009.

This project supports the Integrated Power Systems (IPS) program. IPS provides total ship electric power, including electric propulsion, power conversion and distribution. The DDG 1000 will be an electric drive ship with integrated power architecture. IPS reduces acquisition and operating costs of naval ships and increases military effectiveness. IPS leverages investments in technologies that will be useable by both military and commercial sectors.

IPS has the potential to revolutionize the design, construction, and operation of U.S. naval ships by using electricity as the primary energy transfer medium aboard ship. The flexibility of electric power transmission allows power generating modules with various power ratings to be connected to propulsion loads and ship service in any arrangement that supports the ship's mission at lowest overall cost. Systems engineering in IPS is focused on increasing the commonality of components used across ship types and in developing modules which will be integral to standardization, zonal system architectures, and generic shipbuilding strategies. The purpose of increased commonality is to reduce the total cost of ship ownership by using common modules composed of standard components and/or standard interfaces.

IPS addresses ship platform program goals through: reduced ship acquisition cost through integration of propulsion and ship's service prime movers; lower ship operational costs resulting from more flexible operating characteristics and more efficient components; reduced ship construction costs by allowing more extensive modular construction of power generation, distribution, and loads; improved ship survivability and reduced vulnerability through increased arrangement flexibility and improved electrical system survivability; reduced manning through improved power management systems and reduced on-board maintenance requirements; improved ship signature characteristics; improved design adaptability to meet future requirements of multiple ship types or missions; integrating power management and protection by fully utilizing the power electronics in the system to perform fault protection as well as power conversion and load management functions; simplified technology insertion which allows new technologies to be installed within IPS much less expensively than presently possible; and reduced machinery system acquisition costs through utilization of commercially shared technologies and components.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**	PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	2.500
RDT&E Articles Quantity	0	0	0

System Development: Conduct detailed design and prototype fabrication of power conversion equipment for advanced architecture. Continue to improve baseline power system performance by performing analysis, modeling and simulation, life cycle cost analysis, producibility studies, module development, ship integration, architecture design, ship electric architectures and high power weapons systems requirements, and related efforts. Evaluate emerging technologies for ship applications to determine future feasibility and development requirements. Emerging technologies include fuel cells, high-energy weapons, high power radars, and advanced power electronics.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	2.899
RDT&E Articles Quantity	0	0	0

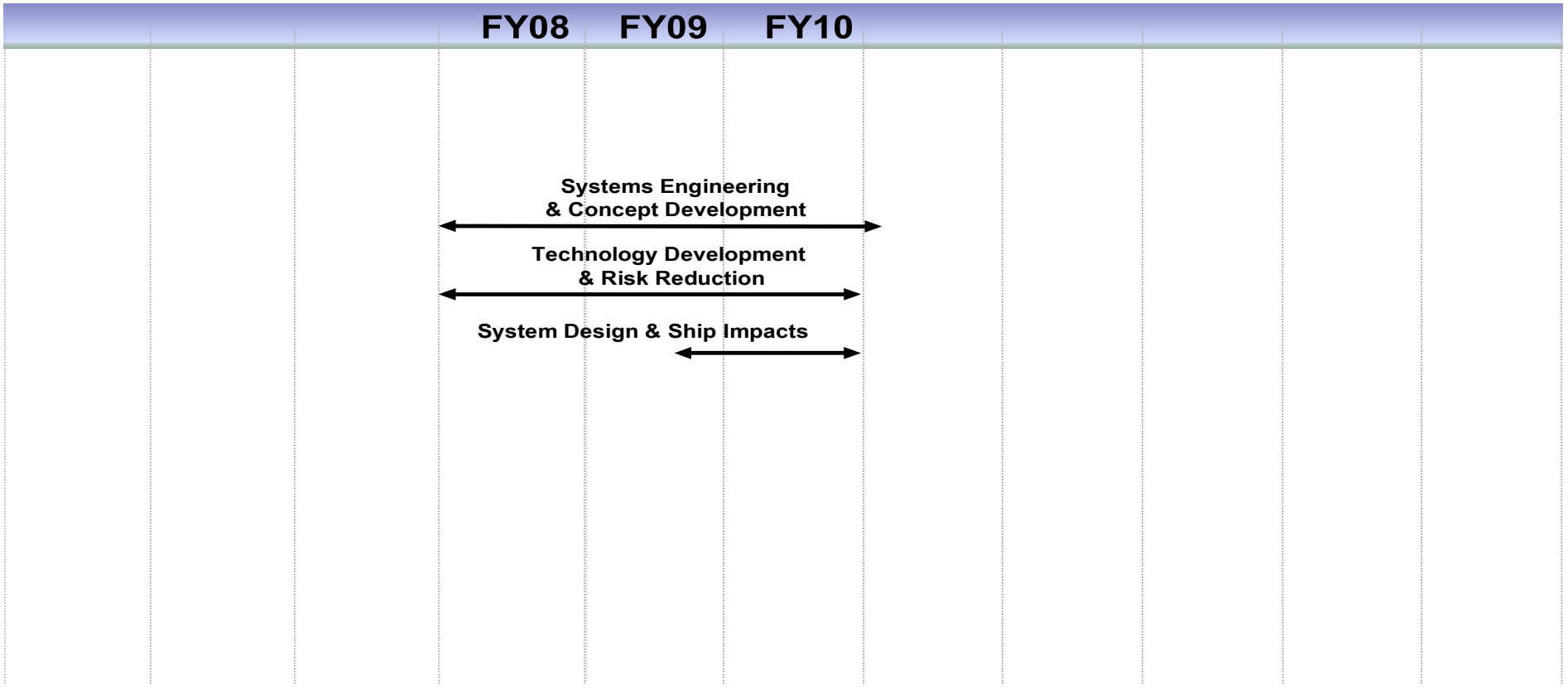
System Test: Conduct land based testing of power conversion equipment at NSWCCD, Philadelphia PA. Mitigate potential risks associated with a fielded IPS system to reduce ship's signature, improve survivability and efficiency by fabricating components, inserting into the IPS test site or an appropriate test platform. Conduct demonstrations to maintain and develop the critical engineering capability and capacity to insert future high power weapon systems (radars, lasers and electromagnetic launch weapons) into DDG1000 and future ship classes including CG(X). Conduct demonstrations to show improved performance and potential to reduce combat system costs.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.200
RDT&E Articles Quantity	0	0	0

Platform Specific: Develop IPS configurations in support of all future surface ship programs. Develop/modify IPS ship configuration documentation including concepts of operations, System Level Description/Requirements, and module performance specifications as necessary to support power system requirements for CG(X) and other surface combatants. Improve ship power system smart product model to support cost/performance tradeoffs of alternative IPS ship configurations and evaluation of emerging electric power system and component technologies.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYS**			PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**					
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			
Primary Hardware Development	C/CPFF	Anteon Corp. Fairfax VA	4.925	0.000		0.700	OCT-09			
Primary Hardware Development	WR	NSWCCD Philadelphia, PA	26.741	0.000		0.500	OCT-09			
Primary Hardware Development	C/CPFF	ADV PWR Elec TBD	0.000	0.000		2.221	OCT-09			
Subtotal Product Development			**31.666**	**0.000**		**3.421**				
Remarks:										
Subtotal Support Costs			**0.000**	**0.000**		**0.000**				
Remarks:										
Developmental Test & Evaluation	WR	NSWCCD Philadelphia, PA	20.005	0.000		2.178	OCT-09			
Subtotal Test and Evaluation			**20.005**	**0.000**		**2.178**				
Remarks:										
Subtotal Management Services			**0.000**	**0.000**		**0.000**				
Remarks:										
Total Cost			**51.671**	**0.000**		**5.599**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**	PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**			PROJECT NUMBER AND NAME **2471/Integrated Power Systems (IPS)**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
System Engineering & Concept Development	1Q-4Q	1Q-4Q	1Q-4Q				
Technology Development & Risk Reduction	1Q-4Q	1Q-4Q	1Q-4Q				
System Design & Ship Impact		3Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**	PROJECT NUMBER AND NAME **9999/Congressional Add**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9D40A/SHIP AFFORDABILITY THROUGH ADVANCED ALUMINUM STRUCTURES	0.000	1.995	0.000
RDT&E Articles Quantity	0	0	0

Provides funding for the development, testing, and evaluation of aluminum components optimized for cost/weight reduction for Littoral Combat Ship (LCS) and other high speed shallow draft vessels designed for littoral combat, multi-mission capability, and intra-theater transport. In addition to design optimization, these tools will also be used to identify specific needs and material solutions in defined thrust areas where validation is necessary to overcome technical barriers to the use of aluminum. These needs may include optimization of existing aluminum alloys and/or development of new aluminum alloys for enhanced corrosion resistance, development of manufacturing technologies to reduce cost and part count, and development of advanced joining technologies such as friction stir welding.

	FY 2008	FY 2009	FY 2010
9807A/Smart Machinery Space System	0.000	2.393	0.000
RDT&E Articles Quantity	0	0	0

Funds the development of a comprehensive, automated CBM+ solution that incorporates Configuration Management (CM), Condition-Based Maintenance (CBM), and Automated Logistics functions.

	FY 2008	FY 2009	FY 2010
9B82A/Low Signature Modular Weapon Platform	0.000	3.191	0.000
RDT&E Articles Quantity	0	0	0

Funding for the Low Signature Modular Weapons Platform was an FY08 Congressional add under RDTEN PE 0603513N. The FY08 Low Signature Modular Weapons Platform project identifies upgrades to the SEALION I first-generation low signature craft. These upgrades are structural modifications to the vessel to support a future modular weapons platform. Previous Congressional adds associated with the SEALION special operations craft have been successfully executed via an effective Government-Industry Integrated Product Team (IPT), responsible for design, construction, technical oversight, and operational test and evaluation. The IPT determined that the FY08 funding was sufficient only to lengthen the SEALION I craft to resemble SEALION II. Having two craft of the same size (equivalent range, speed, endurance and payload capacity) will allow testing and evaluation of multi-craft concepts of operation in support of future special operations craft requirements development.

	FY 2008	FY 2009	FY 2010
9D38A/Analytics For Shipboard Monitoring Systems	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

Analytics for Shipboard Monitoring Systems (ASMS) is an open architecture model that will enhance legacy and new ship capabilities while saving acquisition dollars and yield workload reduction. Moving from stove piped and proprietary systems to open systems will streamline current processes, reduce supporting infrastructure and will support rapid deployment of emerging diagnostic technologies to optimize Fleet readiness and maintenance funds allocation.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603573N/ADVANCED SURFACE MACHINERY SYSTEMS**	PROJECT NUMBER AND NAME **9999/Congressional Add**	

	FY 2008	FY 2009	FY 2010
9971A/ADVANCED COMBATANT MATERIALS RESEARCH	1.555	0.000	0.000
RDT&E Articles Quantity	0	0	0

Advanced Combatant Materials Research: Due to changing operational requirements, ships will require improved stealth, speed, and payload flexibility, which can place additional burdens on ship weight. The Advanced Combatant Materials funding will investigate high strength, damage tolerant, lightweight materials and associated advanced fabrication technologies that can achieve significant weight reduction or improved performance. These include improved marine aluminum alloys, solid state welding processes, novel titanium alloy processing, advanced steels for improved blast and ballistic protection, and a breakthrough in composite - metal joining invented in the UK.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603581N/LITTORAL COMBAT SHIP (LCS)**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	309.446	367.840	360.518				
3096 / Littoral Combat Ship	79.055	101.885	121.913				
3129 / LCS Mission Package Development	98.072	169.765	163.145				
4018 / Littoral Combat Ship Construction	121.887	85.917	75.460				
9821A / Remote Operation of Active Sonar Technology (ROAST)	2.319	0.000	0.000				
9B84A / ASW Contact Management Mission Planning Improvement	2.699	0.000	0.000				
9B86A / LCS Mission Package Enterprise	3.862	0.000	0.000				
9B87A / New Payloads and Sensors Unmanned Surface Vehicle	1.552	0.000	0.000				
9D41A / Autonomous Acoustic Array Advanced Tubular Solid Oxide Fuel Cell	0.000	1.995	0.000				
9D42A / LCS Common Mission Package Training Environment	0.000	4.488	0.000				
9D43A / Alternative Use of Mine Warfare Modules	0.000	3.790	0.000				

A. MISSION DESCRIPTION:

This Program Element (PE) provides funds for detailed design, development, construction, integration and testing of the Littoral Combat Ship (LCS). LCS will be a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and assure naval and joint force access into contested littoral regions. It will use open-systems-architecture design, modular weapons, and sensor systems, and a variety of manned and unmanned vehicles to expand the battlespace and project offensive power into the littoral. LCS will operate with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including littoral anti-submarine warfare (ASW), anti-surface warfare (SUW) and mine countermeasures (MCM). LCS will also possess inherent capabilities, regardless of mission package installed, including intelligence, surveillance, reconnaissance (ISR), homeland defense, Maritime Interdiction/Interception Operations (MIO), anti-terrorism/force protection (AT/FP), air self-defense, joint littoral mobility, and Special Operating Forces (SOF) and logistic support for movement of personnel and supplies. This relatively small, high-speed surface combatant will compliment the U.S. Navy's AEGIS Fleet, DDG 1000, and CG(X) by operating in environments where it is less desirable to employ larger, multi-mission ships. It will have the capability to deploy independently to overseas littoral regions, remain on station for extended periods of time either with a battle group or through a forward-basing arrangement and will be capable of underway replenishment. It will operate with Carrier Strike Groups, Surface Action Groups, in groups of other similar ships, or independently for diplomatic and presence missions. Additionally, it will have the capability to operate cooperatively with the U.S. Coast Guard and Allies.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603581N/LITTORAL COMBAT SHIP (LCS)**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	304.117	371.008	281.407
FY10 President's Budget	309.446	367.840	360.518
Total Adjustments	5.329	-3.168	79.111
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	-2.731	0.000
SBIR/STTR/FTT Assessment	-4.410	0.000	0.000
Program Adjustments	10.000	0.000	88.473
Rate/Misc Adjustments	-0.261	-0.437	-9.362
Total	5.329	-3.168	79.111

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	79.055	101.885	121.913				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Littoral Combat Ship (LCS) will be a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and assure naval and joint force access into contested littoral regions. The threats challenging our naval forces in the littorals include mines, attacks by small surface craft, and quiet diesel submarines armed with a variety of anti-ship weapons. Such threats have great potential to be effectively employed by many less capable countries and non-state actors to prevent access, and use, of littoral areas by U.S. forces.

The LCS will use open-systems-architecture design, modular weapons, and sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littoral. LCS will operate with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including littoral anti-submarine warfare (ASW), anti-surface warfare (SUW) and mine countermeasures (MCM). LCS will also possess inherent capabilities, regardless of mission package installed, including intelligence, surveillance, reconnaissance (ISR), homeland defense, Maritime Interdiction/Interception Operations (MIO), anti-terrorism/force protection (AT/FP), air self-defense, joint littoral mobility, and Special Operating Forces (SOF) and logistic support for movement of personnel and supplies.

This relatively small, high-speed surface combatant will compliment the U.S. Navy's AEGIS Fleet, DDG 1000, and CG(X) by operating in environments where it is less desirable to employ larger, multi-mission ships. It will have the capability to deploy independently to overseas littoral regions, remain on station for extended periods of time either with a battle group or through a forward-basing arrangement and will be capable of underway replenishment. It will operate with Carrier Strike Groups, Surface Action Groups, in groups of other similar ships, or independently for diplomatic and presence missions. Additionally, it will have the capability to operate cooperatively with the U.S. Coast Guard and Allies.

The RDT&E portion of the LCS Program is comprised of design and development efforts required to deliver the Flight 0 Class Ships, including integration with modular MCM, ASW, and SUW mission packages, and construction of the first two Flight 0 Class Ships that will deliver in FY08 and FY09. It includes the design and development effort required to support the introduction of a Flight 0+ baseline for the ships awarded in FY09 and FY10 with the incorporation of lessons learned from the design and construction of LCS 1 and 2, including improved waterjets and a waterjet tunnel extension on the Lockheed Martin (LM) LCS Design. Additionally, it includes design and development efforts required to support the introduction of a new design baseline, including lessons learned from the formal testing of LCS 1 and 2, plus potential standardized components defined in a Navy Design Package.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and underwent a Milestone A update in FY09. Milestone B is planned beyond FY2010.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

The LCS design and development phases include platform design and development, experimentation and ship system design and integration, hull platform testing, initiation of a Navy Design Package, total ship system engineering and integration, planning and conduct of system testing, including procurement of ordnance.

The R&D portion of LCS funding is also comprised of formal Developmental and Operational Assessment testing of the LCS Ships and Mission Packages. Test and Evaluation will concentrate on verifying integration and interoperability of employed technologies and systems in the LCS Seaframe designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS Program's Capabilities Development Document (CDD). T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core Seaframe and the focused missions. Operational testing will include the conduct of formal LFT&E efforts including Full Scale Shock Trials (FSST).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
LCS Class Design Services	0.000	25.000	24.000
RDT&E Articles Quantity	0	0	0

Provides for a Class Design Services contract to both industry design teams for continued design refinement of the Flight 0 and 0+ baseline configurations and design development of future LCS Class Ships. The Navy will use the industry designs to develop a Navy Design Package, a technical data and build specifications package that may be used to support future ship acquisitions.

FY 2009: Develop, review, approve and implement various Engineering Change Proposals determined necessary to the Flight 0+ design Seaframe resulting from production design drawing refinement and improvements to systems and components of each design Seaframe. Develop, review, approve and implement various Engineering Change Proposals resulting from system and design improvements. Examples include, Engine Room Airborne Noise Abatement, Multiple Fire Alarm System stations, Anti-Terrorism Force Protection improvements, Production and Modeling and Simulation Improvements. These changes will then be incorporated in the drawing packages used by the shipbuilders as the baseline for production.

FY 2010: Conduct all industry Systems Engineering design activities supporting the completion and transition to detailed design of the Flight 0+ baseline, including all required reporting documentation. Translate the Flight 0+ baseline design drawings and associated documentation, any systems/component standardization along with information obtained as a result of the Post Delivery Test and Trials into a new design baseline, which incorporates production, assembly and fabrication lessons learned from the previous Seaframe as well as operator feedback from the Seaframe and Mission Package crews obtained during the test and trials period. The result of this effort will be new detailed LCS Design Package which may be incorporated as Government Furnished Information into a Request for Proposal solicitation of the future Seaframes.

	FY 2008	FY 2009	FY 2010
LCS Program Management	12.738	9.400	6.000
RDT&E Articles Quantity	0	0	0

Provides for overall LCS Program operations including technical, production, and logistics oversight, and acquisition, contract, Earned Value (EV), risk, S&T and financial management.

FY 2008: Continued support of Joint Requirements Oversight Council (JROC) reviews and conduct Integrated Product Team (IPT) and Overarching Integrated Product Team (OIPT) events in support of Milestone brief to the Defense Acquisition Executive (DAE). Revised acquisition strategy. Continue contract administration of LCS 1 and LCS 2

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

construction contracts. Continued oversight and analyses of contractor Earned Value (EV). Complete Naval Audit Service reviews of LCS 1 and LCS 2 construction contractors, and continue implementation and monitoring of corrective actions. Completed development of required documentation for proposal solicitation and evaluation for FY09 Flight 0+ Class ships. Conduct source selection for 2 FY09 Flight 0+ Seaframes.

FY 2009: Continue contract administration of LCS 1 & 2 construction contracts, and initiate development of documentation required for contract completion of LCS 1 and LCS 2 construction. Continue oversight and analyses of contractor Earned Value (EV). Conduct strategy and planning activities for source selection for FY09 award of 2 ships. Conduct contract administration transition of new design baseline for Flight 0+ ships under Class Design Services (CDS). Manage execution of LCS 1 & 2 formal Developmental and Operational Testing, including integration efforts with the MCM, ASW and SUW Mission Packages. Conduct strategy and planning activities for source selection for FY10 contract award. Conduct contract administration of the development of a new design baseline, including supporting standardization business cases.

FY 2010: Continue contract administration of transition to new design baseline for Flight 0+ ships. Initiate development of all Milestone B documentation, including new CDD and supporting JROC reviews. Continue to manage execution of LCS 1 & 2 formal Developmental and Operational Testing, including integration efforts with the MCM, ASW and SUW Mission Packages. Conduct contract administration of the development of a new design baseline.

	FY 2008	FY 2009	FY 2010
LCS System-of-Systems Development, Engineering & Experimentation	25.680	37.158	33.106
RDT&E Articles Quantity	0	0	0

Provides for LCS Program Navy systems engineering in support of Flight 0+ and a new baseline design, development, certification, production, including ship system design and integration, combat and C4I design, integration, and test, aviation (manned and unmanned) integration, modular MCM, ASW, and SUW mission package integration, logistics product development and systems engineering activities required to perform risk analyses of new design and production technology concepts.

FY 2008: Continue review of industry engineering, integration, production, and logistics activities that comprise the design and build of the LCS Flight 0 Class Ships. Manage development and approval of technical baselines (Build Specification) and Engineering Change Proposals (ECP). Conduct adjudication of Requests for Deviation/Justification for Technical Deviations. Conduct Independent Verification and Validation (IV&V) for Mission System Ship Integration ICD 1.2 implementation on LCS 1 and LCS 2. Continue development of Tactical Common Data Link (TCDL) solution for LCS integration with Vertical Take-off Unmanned Aerial Vehicle (RQ-8B) (VTUAV). Complete development of LCS Capabilities and Limitations Document. Fund completion of Joint Unmanned Systems Common Control (JUSC2) Advanced Concept Technology Demonstration (ACTD). Initiate GD aluminum structure "grillage" and associated testing. Develop training equipment to support Train to Qualify. Support completion of pre-delivery certifications for LCS 1 and LCS 2. Conduct systems engineering special studies and analyses in response to design, production, and logistics issues. Conduct quality control and assurance efforts. Initiate

preparations for LCS 1 and LCS 2 pre-deployment tests and trials. Conduct Navy systems engineering reviews to support Flight 0 baseline definition for FY09/FY10 awards (Flight 0+). Flight 0+ includes lessons learned, Naval Vessel Rules (NVR), and life-cycle enhancements for waterjets.

FY 2009: Complete review of industry engineering, integration, production, and logistics activities that comprise the design and build of the LCS Flight 0 Class ships. Manage integration of SUW Mission Packages with LCS 1 and 2 and Independent Verification and Validation (IV&V). Implement Tactical Common Data Link (TCDL) integration solution on LCS-1 & 2. Complete GD aluminum "grillage" and associated testing and LM Launch, Recovery and Handling risk reduction testing to raise Technology Readiness Levels. Support completion of post-delivery certifications for LCS 1 and 2. Develop facilities support plans for CONUS locations. Provide systems engineering support for LCS 1 and 2 post-delivery test and trials. Conduct system engineering special studies and analyses in response to emergent design/production issues highlighted in testing. Manage the development, approval, and transition to production of Flight 0+ technical baselines (Build Specifications) and ECPs. Initiate efforts on SH-60B Data link integration. Conduct Spiral Development efforts to support the potential standardization of LCS Combat System, C4I, and HM&E components for the new baseline design LCS by development of business cases for procurement of systems as GFE or CFE, as common systems between the LM and GD designs, or as common with the LCS Mission Packages. For specific systems selected, develop acquisition documentation for the FY10 procurement of LCS (interface control documents, SPDs, etc). Manage the development of the new Navy Design Package baseline.

FY 2010: For LCS 2, continue the review of industry engineering, integration, production, and logistics activities that comprise the integration of the Flight 0+ design in the FY09/FY10 ships. Manage the integration of ASW, SUW, and MCM Mission Packages for LCS 1 and 2 and IV&V. Provide systems engineering support for LCS 1 and 2 post-delivery test and trials. Conduct system engineering special studies and analyses in response to emergent design/production issues highlighted in testing. Complete efforts on SH-60B Data link integration. Complete Spiral Development efforts to support the potential standardization of LCS Combat System, C4I, and HM&E components for the new LCS baseline design. Develop acquisition documentation for the follow-on procurement of LCS (interface control documents, SPDs, etc). Manage the development, approval, and transition to production of new LCS technical baselines (Build Specifications) and ECPs. Develop all required systems engineering Milestone B documents and support the FY10 source selection and award of new baseline LCS ships.

	FY 2008	FY 2009	FY 2010
LCS Total System Training Architecture	17.460	6.103	10.900
RDT&E Articles Quantity	0	0	0

Provides for an LCS with a shipboard and shore-based embedded training capability to satisfy individual, unit, team and force training both in port and at sea, and provides capability to leverage DDG 1000 Total Ship Training System efforts, as well as support LCS Train to Qualify requirements.

FY 2008: Completed LCS 1 Trainer, began LCS 2 (General Dynamics Design) Trainer.
FY 2009: Complete upgrade to LCS 1 (Lockheed Martin Design) Trainer.
FY 2010: Update Trainers to as-built configuration to meet train to qualify certification requirements.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**	

	FY 2008	FY 2009	FY 2010
LCS Test & Evaluation	23.177	24.224	47.907
RDT&E Articles Quantity	0	0	0

Execute formal LCS Test and Evaluation (T&E) program, Developmental Testing and Operational Testing (DT/OT) including Live Fire Test and Evaluation (LFT&E) and procurement of T&E Ordnance. Developmental Test and Evaluation (DT&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the Sea Frame designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS Program's Capabilities Development Document (CDD). DT&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core Seaframe and the focused missions. Operational Testing for the LCS will be conducted in three phases; three phases of IOT&E on each Seaframe design to support the development of the initial seaframe deliveries and a specific mission package, and FOT&E, as required, when new capabilities are developed or refined.

FY 2008: Complete the development of a Flight 0 TEMP based on the currently approved CDD and update, as required, to support the Flight 0+ CDD expected to enter the review cycle early 2008. Complete development of detailed plans for assessment of both LCS Seaframe designs equipped with each focused mission capabilities. Objectives of these events will include assessment of all Seaframe Key Performance Parameters and additional attributes and will be done in conjunction with the Post Delivery Test and Trials (PDT&T) periods of LCS 1 and 2. The planning will include developing detailed scenarios for evaluation of each focused mission capability (MCM, ASW, and SUW) and core Seaframe capability including Air Defense, Surface Warfare (SUW) Self Defense, Aviation capability, Seakeeping/Safe Operating Envelope/Directional Stability trials, and support the conduct of events necessary for the completion of crew certification. Key products to be developed include a TEMP, and Detailed Test Plans and Data Acquisition and Management Plans (DAMP). Continue LFT&E modeling and simulation (M&S), Component & System Shock Tests. Continue review and assessment of industry test activities. Initiate procurement of T&E Ordnance to support LCS Class tests.

FY 2009: Continue LCS LFT&E Modeling and Simulation and validation testing. Initiate LCS 1 and LCS 2 Developmental Testing. DT&E will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), Key Performance Parameters (KPP), and additional attributes for the core Seaframe and the focused mission capabilities. Complete procurement of T&E Ordnance to support LCS 1 and 2 tests and trials. Conduct the following specific tests for LCS 1 and 2:
Aviation Certification Testing (including assessment of TRIGON system on LCS 1, and Dynamic Interface testing of both Seaframes with MH-60 and RQ-8B)
Engineering Operational Sequencing System/Combat System Operational Sequencing System (EOSS/COSS) validation.
Class Tactics Publication validation
Safe Operating Envelope Trials
Underway Replenishment Qualification Trials and Vertical Replenishment Trials
Structural Test Firings (57mm, RAM, Super Rapid blooming Off-board Chaff (SRBOC))
Information Assurance Testing

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

Dynamic Interface (DI) for the helicopter and VTUAV
HM&E Trials, including machinery vibration trials, full power runs, power and maneuvering tests, and propulsion assessments in sea states 1-7
Mast Cut Out Characterization
Core weapon system (57mm) range banding, warning and disabling tests and casualty firing for both surface and air defense
Radar and Combat System Characterization, including Tracking exercises and jamming exercises
ASW MP integration tests
SUW MP engineering tests with 30mm gun
EMC/EMI Certification
Conduct Human Systems Integration Testing
OCONUS and CONUS Logistics assessments
Conduct the correction of material deficiencies and emergent repairs to equipment that could adversely affect the performance of conducting above LCS class tests

FY 2010: Continue LCS LFT&E Modeling and Simulation and validation testing. Continue LCS 1 and LCS 2 Developmental Testing. Perform Operational Assessments on LCS 1 and 2 with the MCM MP. DT&E will include the evaluation of Critical MCM MP. Conduct TECHEVAL on LCS 1 with the MCM MP. Perform Final Contractor Trials (FCT). DT&E and TECHEVAL will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Key Performance Parameters (KPP), and Additional Attributes for the core Seaframe and focused mission capabilities. Operational Assessment (OA) will include the evaluation of the Critical Operational Issues (COI) for the Seaframes and MCM Mission Package.

Conduct the following specific tests:
Magnetic and Acoustic Trials
Engineering Operational Sequencing System/Combat System Operational Sequencing System (EOSS/CSOSS) validation
Class Tactics Publication validation
OCONUS and CONUS Logistics Assessments
Underway Replenishment Qualification Trials
HM&E Trials, including machinery vibration trials, full power runs, power and maneuvering tests, and propulsion assessments in sea states 1-7
Seaframe Characterization tests including RCS characterization, Infrared (I/R) Visual testing, and Air Traffic Control Beacon System, Identification friend or foe, Mark XII/Mark XIIA, System (AIMS) Trials
Shipboard Electronic Evaluation Facility (SESEF) tests to support Tactical Air Navigation Certification and provide antennae patterns

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

Developmental testing MCM MP including integration of MPCE and mission systems with each seaframe, launch and recovery of mission systems and conducting MCM mission tests
Develop test plans for Total Ship Survivability Trial (TSST) testing, continue development of Full Scale Shock Trial (FSST) test plans
EMC/EMI Certification with MCM MP
Developmental testing of the ASW MP including integration of ASW Mission Systems and Mission Package Computing Environment (MPCE), launch and recovery of mission systems and conducting ASW mission tests
Developmental testing of the SUW MP including the integration of SUW Mission Systems and MPCE, Structural Test firing of 30mm gun
Operation Assessment for LCS 1 and 2 with the MCM MP
Conduct Human Systems Integration Testing
TECHEVAL of LCS 1 with the MCM MP
Final Contract Trials on LCS 1: a material inspection conducted by INSURV to demonstrate compliance with contract requirements.
Conduct the correction of material deficiencies and emergent repairs to equipment that could adversely affect the performance of testing.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**	

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
BLI 1600 (OPN)	0.000	73.684	137.259						210.943
BLI 2127 (SCN)	0.106	1,016.952	1,380.000						2502.952
BLI 4221 (WPN)	0.000	2.778	0.000						2.778
BLI 0443 (APN)	37.432	50.189	77.616						165.237
BLI 1B4B/14B50 (O&MN)	7.885	11.854	9.296						29.035
BLI 1B5B/15BR0 (O&MN)	22.562	24.804	20.737						68.103
BLI 1C1C/11C70 (O&MN)	0.000	1.551	1.746						3.297

D. ACQUISITION STRATEGY:

The LCS Program takes an evolutionary approach to acquisition that emphasizes completion of two initial Seaframe designs, the LCS Flight 0 Class ships, by two industry teams.

The incorporation of lessons learned from the design, construction, and testing of two ships, as well as introduction of improved waterjets and a waterjet tunnel extension on the LM LCS design will comprise the Flight 0+ baseline awarded in FY09. The LCS Program Acquisition Strategy, uses a limited competition approach for existing industry teams to compete for the construction of Flight 0+ Class Ships in FY10. The LCS Program will concurrently initiate Class Design Services contracts to both industry design teams for conduct of all industry Systems Engineering design activities supporting the completion and transition to production of the Flight 0+ baseline, including all required reporting and development of a Navy Design Package.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Defense Acquisition Executive (DAE) review in FY09. Milestone B has been planned beyond FY10.

E. MAJOR PERFORMERS:

Major Contractors:
General Dynamics - Bath Iron Works, Bath, ME
Austal USA, Mobile, AL
Lockheed Maritime Systems and Sensors, Moorestown, NJ
Marinette Marine Corporation, Marinette, WI
Bollinger Shipyards, LA

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

Government Field Activities:

NSWC Dahlgren, Dahlgren, VA

NSWC Carderock, Philadelphia, PA

Space and Naval Warfare Command (SPAWAR), Charleston, SC

NSWC Port Hueneme, Port Hueneme, CA

Universities:

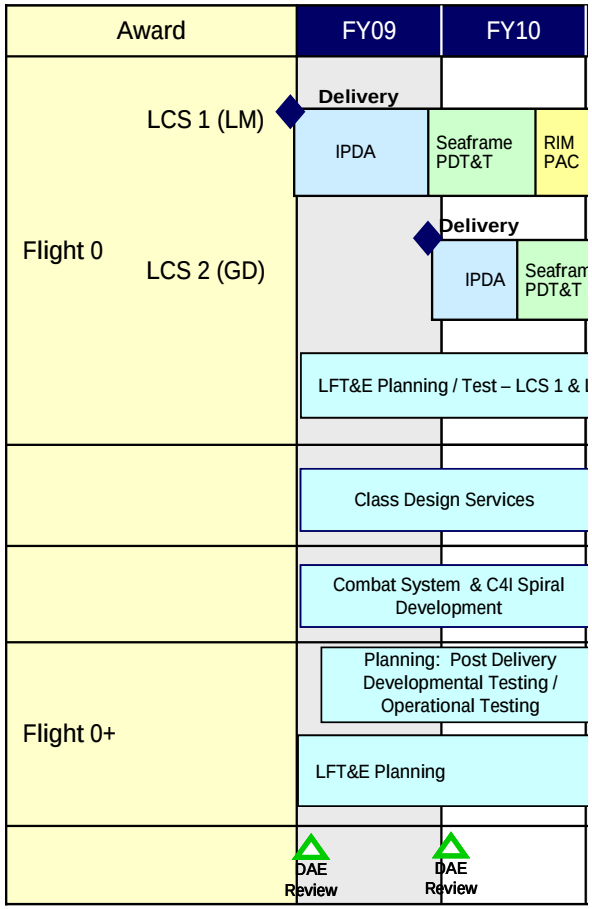
Johns Hopkins University Applied Physics Lab, Laurel, MD

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**						
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
Preliminary Design (Flight 0)	Compet	LM, BIW, Raytheon	32.173			0.000		0.000			32.173	0.000
Final Design (Flight 0)	Compet	LM, BIW	175.263			0.000		0.000			175.263	0.000
Class Design Services	Single Src	TBD	4.800			25.000	JUN-09	24.000	OCT-09		63.800	0.000
LCS 1 & 2 Shore Trainers	Cost Plus	LM, BIW	17.760			6.103	MAR-09	10.900	OCT-09		34.763	0.000
SH-60B Datalink	Compet	LM, BIW	0.000			2.435	OCT-08	0.000			2.435	0.000
Flight 0 C4I	SPD	PEO C4I	4.982			0.300	MAR-09	0.291	OCT-09		5.573	0.000
Life Cycle Support Plan	Compet	DCMA/LM	1.000			0.000		0.000			1.000	0.000
Subtotal Product Development			**235.978**			**33.838**		**35.191**			**315.007**	**0.000**
Remarks:												
Government Engineering Support	WX	NSWC/CD, Bethesda, MD	16.503			0.000		0.000			16.503	0.000
Government Engineering Support	WX	NSWC/DD, Dahlgren, VA	24.607			5.000	OCT-08	6.000	OCT-09		36.607	0.000
Government Engineering Support	WX	NSWC/PC, Panama City, FL	22.103			1.500	OCT-08	1.000	OCT-09		24.603	0.000
Government Engineering Support	WX	NUWC, Newport, RI	7.909			0.690	OCT-08	0.185	OCT-09		8.784	0.000
Government Engineering Support	WX	NAWC AD, Pax River	9.775			1.700	OCT-08	2.652	OCT-09		15.127	0.000
Government Engineering Support	WX	NSWC/CR, Crane, IN	15.875			0.750	OCT-08	0.243	OCT-09		16.868	0.000
Government Engineering Support	WX	NSWC/SSES, Philadelphia, PA	26.370			5.850	OCT-08	8.626	OCT-09		43.846	0.000
Government Engineering Support	Various	Government Activities	19.360			9.515	OCT-08	9.387	OCT-09		38.262	0.000
Contractor Engineering Support	Seaport	Alion, Arlington, VA	19.351			5.000	OCT-08	1.700	OCT-09		26.051	0.000
Contractor Engineering Support	Seaport	Various	17.723			2.500	OCT-08	2.207	OCT-09		22.430	0.000
Labor (Research Personnel)	CPFF	APL/JHU, Laurel, MD	4.030			2.500	OCT-08	1.486	OCT-09		8.016	0.000
Government Engineering Support	RX	NAVAIR	2.000			0.000		0.000			2.000	0.000
Subtotal Support			**185.606**			**35.005**		**33.486**			**259.097**	**0.000**
Remarks:												
Test & Evaluation	Seaport	Alion, Arlington, VA	4.504			1.200	OCT-08	2.660	OCT-09		11.364	0.000
Test & Evaluation	WX	NSWC/CD, Bethesda, MD	0.650			0.000		0.000			0.650	0.000
Test & Evaluation	WX	NSWC/PHD, Port Hueneme, CA	10.117			3.201	OCT-08	4.829	OCT-09		18.147	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**						
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
Test & Evaluation	WX	NSWC/SSES, Philadelphia, PA	11.000			1.900	OCT-08	5.2	OCT-09		21.100	0.000
Test & Evaluation	WX	NSWC/PC, Panama City, FL	1.230			1.900	OCT-08	1.846	OCT-09		4.976	0.000
Test & Evaluation	WX	COMOPTEVFOR	2.749			2.500	OCT-08	2	OCT-09		7.249	0.000
Test & Evaluation	WX	NSWC/COR, Corona, CA	1.800			0.800	OCT-08	0.8	OCT-09		3.400	0.000
Test & Evaluation	WX	Various	14.048			5.418	OCT-08	12.229	OCT-09		37.695	0.000
T&E Ordnance	WX	IWS 3	5.577			4.323	OCT-08	0			9.900	0.000
T&E	Comp	LM/GD	0.000			1.000	OCT-08	16.7	OCT-09		22.700	0.000
T&E	WX	SPAWAR, SC	3.075			1.400	OCT-08	0.972	OCT-09		5.447	0.000
Subtotal T&E			**54.750**			**23.642**		**47.236**			**142.628**	**0.000**
Remarks:												
Government Travel		NAVSEA	0.933			0.300	OCT-08	0.100	OCT-09		1.333	0.000
CODB		PEO Ships	2.430			1.650	OCT-08	0.000	OCT-09		4.080	0.000
Program Management Support		Alion, Arlington, VA	15.602			2.330	OCT-08	5.400	OCT-09		31.332	0.000
Program Management Support		Various	1.650			3.820	OCT-08	0.200	OCT-09		5.670	0.000
Program Management Support		NSWC/SSES, Philadelphia, PA	1.208			0.750	OCT-08	0.200	OCT-09		2.158	0.000
Program Management Support		JJMA, Arlington, VA	0.990			0.550	OCT-08	0.100	OCT-09		1.640	0.000
Program Management Support		DOD	3.208			0.000		0.000			3.208	0.000
Subtotal Management			**26.021**			**9.400**		**6.000**			**49.421**	**0.000**
Remarks:												
Total Cost			**502.355**			**101.885**		**121.913**			**766.153**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**

LCS RDT&E (3096)Schedule



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**			PROJECT NUMBER AND NAME **3096/Littoral Combat Ship**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Post Delivery Developmental Testing / Operational Testing - Flight 0 Ships		1Q-4Q	1Q-4Q				
Class Design Services		1Q-4Q	1Q-4Q				
Combat System & C4I Spiral Development		1Q-4Q	1Q-4Q				
Shock Planning/Test (LFT&E)	1Q-4Q	1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	98.072	169.765	163.145				
RDT&E Articles Qty	0	1	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Program provides focused war fighting capabilities in littoral mine warfare, small boat threat neutralization and littoral anti-submarine warfare to provide assured access to enable the US Joint Force operations in the littoral. Mission module development includes architectures, interfaces and development of mission module. Mission systems development also includes the procurement of the first mission packages to be used on the Flight 0 Littoral Combat Ships (LCS).

Mine Warfare Mission Modules will provide the Joint Force Commander with the capability to conduct Mine Counter Measure (MCM) operations ranging from first response mine detection and avoidance, to neutralization and sweeping in littoral conditions, enabling Joint Forcible Entry. This will open transit lanes and operating areas for naval forces. MCM operations will reduce the access timeline in contested littorals.

Anti-Submarine Warfare Modules will provide ASW capabilities while operating in a contested littoral environment. Leveraging multiple distributed sensors netted together, LCS will exploit real time undersea data, using maneuver and deception to enhance detection, classification, identification, targeting and destruction of enemy submarines.

Surface Warfare Mission Modules will provide the capability to detect, track and engage small boat threats, giving the joint force commander the ability to maximize striking power, shield high value units, or successfully move through a restricted area.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.714	2.530	2.709
RDT&E Articles Quantity	0	0	0

1.1 SYSTEM ENGINEERING

FY08: Prepare program specifications requirements and documentation to include: Information assurance, modeling and simulation, Configuration Management (CM), and safety engineering efforts. Systematically identify potential hazards in the development, test, integration and operation of the Mine Countermeasures (MCM), Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (SUW) Mission Packages (MP). Develop sea frame simulation software to support MCM/ASW/SUW MP interface testing to the Sea frame. Development of a Littoral Combat Ship (LCS) Mission Module Incremental Development Program Strategy.

FY09: Continuation of Information assurance, modeling and simulation, CM, Incremental Development, and safety engineering efforts.

FY10: Continuation of modeling and simulation, program safety, and CM.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	7.954	7.830	8.652
RDT&E Articles Quantity	0	0	0

1.2 PROGRAM MANAGEMENT

FY08: Continue program-level program management efforts, including Contract Advisory and Assistance Services (CAAS): business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware elements and are not included in systems engineering. Develop document, maintain and execute logistic plans, processes and programs to assist in the management and support of Mission Modules and Mission Packages. Provide Risk Management; Determine production approval status of each Mission Package and its effect on contracting and delivery.

FY09-FY10: Continue program-level program management efforts, including CAAS: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware elements and are not included in systems engineering. Maintain and execute logistic plans, processes and programs to assist in the management and support of Mission Modules and Mission Packages. Provide Risk Management.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	3.363	5.960	10.322
RDT&E Articles Quantity	0	0	0

1.3 SYSTEM TEST AND EVALUATION

FY08: Test Planning Support in the identification of all LCS MCM, SUW, and ASW operational effectiveness requirements from reference documents. Development of Operational Test Objectives database populated with Measures of Effectiveness (MOEs) and Measure Of Suitability (MOSs), Operational Scenarios, and applicable analytical process for each metric. Analysis of current Office of Naval Intelligence (ONI) threat assessment and existing representative minefields to include generation of operational scenarios of sufficient latitude to encompass the data necessary for reduction to resolve applicable Critical Operational Issues (COIs). COMOPTEVFOR support for Operational Test and Evaluation (OT&E) of the MCM and ASW mission packages with the seaframes, including long-lead testing management continuity. Mission package Certification efforts in order to support pre-Developmental Testing/Operational Testing (DT/OT) work. Continued development and use of the Mission Package Development Lab (MPDL) to support MP software testing, Information Assurance conformance, Mission Package Certification efforts.

FY09: Continuation of Mission Package certification efforts for MCM MP, conduct DT of the MCM MP on board LCS-1.

FY10: Continuation of Mission Package certification efforts for ASW, and SUW. Conduct DT of the MCM MP on board LCS-2; conduct ASW DT on board LCS-1; conduct SUW DT on board LCS-1/2.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.967	1.497	1.054
RDT&E Articles Quantity	0	0	0

1.4 INTEGRATION, ASSEMBLE, TEST AND CHECKOUT

FY08: Provide systems engineering and program management support for the integration planning of Mission Module Packages for LCS ship classes. Provide technical analyses and support studies for systems integration of Mission Module/Packages on LCS ship classes.

FY09-FY10: Continue program-level Integration, Assembly, Test & Checkout efforts: technical and functional activities associated with the design, development, and production of mating surfaces, structures, equipment, parts, materials, and software required to assemble hardware/software elements into mission equipment.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**	

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.996	1.656	13.111
RDT&E Articles Quantity	0	0	0

1.5 TRAINING

FY08: Development and incorporation of all MCM, ASW, and SUW Mission Package information required to be included in the Navy Training Systems Plan (NTSP). Develop training services, devices, accessories, aids and equipment. Assist in planning, implementing and managing a proactive training program that ensures a high level of training completions and successful LCS Mission Module crew certification for introduction to the Fleet for the MCM, ASW and SUW Mission Packages.

FY09 - Complete the incorporation of all MP information into the NTSP, Continue the implementation and management of a proactive training program, continue program-level training efforts: Design, develop, produce, and deliver training services, devices, accessories, aids, equipment.

FY10 - Start the development of the software for the technical trainer in support of the CDD requirements for Train-to-Certify and Train-to-Qualify. First years efforts will focus on MCM.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	10.769	47.806	31.221
RDT&E Articles Quantity	0	0	0

1.12 COMMON EQUIPMENT

FY08: Mission Package Computing Environment (MPCE) - Development, integration, & testing to support the Hardware (H/W) for Mission Packages ASW, MCM, and SUW; Mission Package Integration and Certification, Unmanned Surface Vehicle (USV) Development; integration of common Command and Control, and technical support for system test and evaluation. Develop, Configure, Install, and Maintain LCS MPCE. The MPCE consists of General Purpose Computing Equipment, General Purpose Consoles, and roll on/roll off computing equipment. Procure lab integration and test equipment to support integration/regression test events. Manage MPCE hardware procurement, inventory management, and development suite hardware inventory database. Provide a coordinated point for all hardware inventories and allow rapid and accurate accountability, deployment, and/or support. Multi-Vehicle Communication System (MVCS) provide the communications systems capabilities that support LCS mission package unmanned vehicle requirements. This includes all non-recurring engineering (NRE) for mission package communications to develop, test, and integrate the hardware and software that directly supports MP requirements.

FY09: Mission Package Computing Environment (MPCE)- Mission Package Operating Environment (MPOE) Platform Development - manage software configuration(s), identify and acquire required components, test for compatibility, and deliver post-installation security lock-down scripts. Develop MPCE Integrated Logistics support (ILS) documentation, conduct vendor Training. Document the LCS mission package concept of operations, functional & performance requirements, interfaces, and computing environment. Conduct MPCE Integration and Test events on the Seaframes and at LCS 1 and LCS 2 land-based facilities.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

Multi-Vehicle Communication System (MVCS)- The Mission Package Off Board Communications will provide the communications systems capabilities that support LCS mission package unmanned vehicle requirements. Conduct INCO on LCS sea frame.

MH-60 B/R/S - Initiate the design, development, and prototyping of the Ku-band Common Data Link (CDL) Kit for installation in an SH-60B helicopter to allow the SH-60B to communicate with LCS via its shipboard CDL system. Design, and development a C4ISR Multiplexer / De-Multiplexer Interface Unit. Design and development of Fast Track Imaging (FTI) sets for installation in an MH-60S helicopter.

FY10: MPCE - Support the conduct of Mission Package developmental testing, correct deficiencies observed during testing.

MVCS - Support MVCS Full Capability ship installation, update technical data package after ship installation. Integrate Beyond Line of Sight (BLOS) capability into MVCS. Conduct DT of MVCS increment 1 capability onboard LCS sea frame.

MH 60 B/R/S - Complete the development of the Ku-Band CDL Helo Support Functional segment, install onboard LCS sea frame and conduct integration testing.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	10.719	23.118	12.416
RDT&E Articles Quantity	0	0	0

1.13 MINE WARFARE (MCM) MISSION PACKAGE

FY08: Continue MP 1 Integration and testing. Conduct shore based End to End testing. Develop USV and Sweep system. Continue Software development and testing. Continue development efforts for the MCM Mission Package: designs, development, production, integration, assembly, test and operation of MCM MP 1.

FY09: Continue integration of Spiral A Mission Modules. Design, develop, integrate and test mission modules for remainder of systems needed to complete Spiral A baseline. Develop, integrate and test USV and Sweep systems. Develop test procedures and documentation. Integrate the MCM MP with LCS sea frame.

FY10: Conduct at sea integration (end-to-end) testing. Conduct developmental testing (DT) with sea frame. Correct of deficiencies observed during testing. Conduct Certification of MCM MP to include weapons system certification, Human Systems Integration (HSI), Information Assurance, and Safety. Integrate the SMCM UUV w/LFBB.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	20.700	5.993	10.795
RDT&E Articles Quantity	0	0	0

1.14 ASW MISSION PACKAGE

FY08: Continue development efforts of ASW Mission Package #1: design, development, production, integration, assembly, test and operation of the entire ASW Mission Package.

FY09: Complete integration of the ASW MP, conduct at-sea testing of ASW MP#1.

FY10: Complete end-to-end testing of ASW MP#1, integrate the ASW MP with the LCS sea frame and conduct DT events.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	36.300	67.450	66.784
RDT&E Articles Quantity	0	1	0

1.15 SUW MISSION PACKAGE

FY08: Design, develop, integrate and test and deliver the first interchangeable gun weapon system (30mm Gun module) and medium range surface-to-surface missile weapon system (NLOS module). Includes the NRE associated with the design, development and test of the Gun Mission Module (GMM) subsystems to provide the GMM requirements specified in the LCS Capability Development Document (CDD). Provide required funds to PEO Missiles & Space for NLOS development in support of the Navy requirements.

FY09: Provide required funding to PEO Missiles & Space for NLOS development. Develop the power converter solution for the NLOS Mission Module. Develop and maintain the LCS SUW T&E Road-map and Master Test Plan. Conduct testing of the GMM, the Container Launch Unit (CLU), and the Mission Module. Develop Training and Preliminary Maintenance Plans for the GMM.

FY10: Purchase NLOS PAM test Missiles. Conduct GMM integration testing with sea frame and combat systems, conduct structural test firing and End-to-End testing of the GMM.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.160	1.625	1.929
RDT&E Articles Quantity	0	0	0

1.16 Portable Mission Package Computing Environment

FY08: Design, Develop, integrate and check out a Portable Mission Package Computing Environment (P-MPCE) .

FY09-FY10: Provide technical expertise in the development and configuration of the P-MPCE. Conduct systems engineering, design, development, and integration tasks to support implementation of a P-MPCE core capability. Track/Coordinate the development and installation of the P-MPCE components within the transportable support container. Perform software and hardware integration to support P-MPCE baseline, revise Information Assurance (IA) plan and network topology, conduct system groom, perform test and checkout of P-MPCE and ancillary systems.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.430	4.300	4.152
RDT&E Articles Quantity	0	0	0

1.19 PRE-PRODUCTION ENGINEERING

FY08: Develop a plan for preparing a production quality technical data package (TDP) for LCS MPs. Manage the Class II Change Board for all Mission Packages.

FY09: Convert existing MCM MP TDP data to needed format and develop any needed drawings to complete the MP TDP.

FY10: Convert existing ASW and SUW MP TDP data to needed format and develop any needed drawings to complete the MP TDP

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**	

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
BLI 1600 (OPN)	0.000	73.684	137.259						210.943
BLI 2127 (SCN)	0.106	1,016.952	1,380.000						2502.952
BLI 4221 (WPN)	0.000	2.778	0.000						2.778
BLI 0443 (APN)	37.432	50.189	77.616						165.237
BLI 1B4B/14B50 (O&MN)	7.885	11.854	9.296						29.035
BLI 1B5B/15BR0 (O&MN)	22.562	24.804	20.737						68.103
BLI 1C1C/11C70 (O&MN)	0.000	1.551	1.746						3.297

D. ACQUISITION STRATEGY:

(U) The LCS acquisition strategy encompasses multiple phases: Phases I and II are Concept Refinement and Technology Development, consisting of Preliminary Design, Final Design and Detail Design and Construction for Flight 0 ships. A parallel three phase approach is planned for Flight 0+ ships. - Preliminary System Design, - Final System Design and - Detail Design and Construction.

E. MAJOR PERFORMERS:

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**						
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
1.1 System Engineering	WX	Various	6.575			2.530	OCT-08	2.709	OCT-09		11.814	0.000
1.3 System Test and Evaluation	WX	Various	18.559			5.960	OCT-08	10.322	OCT-09		34.841	0.000
1.4 Integ, Assem, Test and Check	WX	Various	0.967			1.497	OCT-08	1.054	OCT-09		3.518	0.000
1.5 Training	WX	Various	4.163			1.656	OCT-08	13.111	OCT-09		18.930	0.000
1.12 Common Equipment	WX	Various	10.919			36.787	OCT-08	22.304	OCT-09		70.010	0.000
1.13 Mine Warfare MP	WX	Various	74.012			23.118	OCT-08	10.443	OCT-09		107.573	0.000
1.14 ASW MP	WX	Various	140.271			5.993	OCT-08	6.211	OCT-09		152.475	0.000
1.15 SUW MP	WX	Various	36.300			56.300	OCT-08	43.552	OCT-09		136.152	0.000
1.16 Portable MP Computing Environment	WX	Various	0.160			0.000		0.000			0.160	0.000
1.19 Pre Production Engineering	WX	Various	0.430			4.300	OCT-08	4.152	OCT-09		8.882	0.000
Subtotal Product Development			**292.356**			**138.141**		**113.858**			**544.355**	**0.000**
Remarks:												
1.1 System Engineering	WX	Various	2.405			0.000		0.000			2.405	0.000
1.12 Common Equipment	WX	Various	2.625			11.019	DEC-08	8.917	OCT-09		22.561	0.000
1.13 Mine Warfare (MCM) MP	WX	Various	4.600			0.000		1.973	OCT-09		6.573	0.000
1.14 ASW MP	WX	Various	19.325			0.000		4.584	OCT-09		23.909	0.000
1.15 SUW MP	WX	Various	15.879			11.150	NOV-08	23.232	OCT-09		50.261	0.000
1.16 Portable MP Computing Environment	WX	Various	0.000			1.625	OCT-08	1.929	OCT-09		3.554	0.000
Subtotal Equipment and Hardware			**44.834**			**23.794**		**40.635**			**109.263**	**0.000**
Remarks:												
Program Management	WX	Various	13.049			7.830	OCT-08	8.652	OCT-09		29.531	0.000
Subtotal Management			**13.049**			**7.830**		**8.652**			**29.531**	**0.000**
Remarks:												
Total Cost			**350.239**			**169.765**		**163.145**			**683.149**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**

Mission Package Delivery Schedule

	FY08	FY09	FY10	FY11	FY12			
MCM Mission Package		△ MCM QTY1 OPN			△ MCM QTY 1 OPN			
ASW Mission Package	△ ASW QTY 1 RDT&EN							
SUW Mission Package	△ SUW QTY 1 RDT&EN	△ SUW QTY 1 RDT&EN		△ SUW QTY 1 RDT&EN	△ SUW QTY 1 OPN			

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**			PROJECT NUMBER AND NAME **3129/LCS Mission Package Development**			
Schedule Profile	FY 2008	FY 2009	FY 2010	FY2011	F2012		
MCM MP Deliveries		SEP 09			SEP 11		
ASW MP Deliveries	SEP 08						
SUW MP Deliveries	AUG 08	AUG 09		SEP 11	SEP 11		

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**				PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	121.887	85.917	75.460				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Littoral Combat Ship (LCS) will be a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and assure naval and joint force access into contested littoral regions. The threats challenging our naval forces in the littorals include mines, attacks by small surface craft, and quiet diesel submarines armed with a variety of anti-ship weapons. Such threats have great potential to be effectively employed by many less capable countries and non-state actors to prevent access, and use, of littoral areas by U.S. forces.

The LCS will use open-systems-architecture design, modular weapons, and sensor systems, and a variety of manned and unmanned vehicles to expand the battlespace and project offensive power into the littoral. LCS will operate with focused-mission packages that deploy manned and unmanned vehicles to execute a variety of missions, including littoral anti-submarine warfare (ASW), anti-surface warfare (SUW) and mine countermeasures (MCM). LCS will also possess inherent capabilities, regardless of mission package installed, including intelligence, surveillance, reconnaissance (ISR), homeland defense, Maritime Interdiction/Interception Operations (MIO), anti-terrorism/force protection (AT/FP), air self-defense, joint littoral mobility, and Special Operating Forces (SOF) and logistic support for movement of personnel and supplies.

This relatively small, high-speed surface combatant will compliment the U.S. Navy's AEGIS Fleet, DDG 1000, and CG(X) by operating in environments where it is less desirable to employ larger, multi-mission ships. It will have the capability to deploy independently to overseas littoral regions, remain on station for extended periods of time either with a battle group or through a forward-basing arrangement and will be capable of underway replenishment. It will operate with Carrier Strike Groups, Surface Action Groups, in groups of other similar ships, or independently for diplomatic and presence missions. Additionally, it will have the capability to operate cooperatively with the U.S. Coast Guard and Allies.

The RDT&E portion of the LCS Program is comprised of design and development efforts required to deliver the Flight 0 Class Ships, including modular MCM, ASW, and SUW mission packages, construction of the first two Flight 0 Class Ships that will deliver in FY08 and FY09 and the incorporation of lessons learned from the design, construction, and testing of the first two ships. Also includes the introduction of improved waterjets on both designs and a waterjet tunnel extension on the LM LCS design which will comprise the Flight 0+ baseline.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Milestone A update.
The LCS construction phase includes the construction of two LCS Fight 0 Class Ships, one of each of two designs, by DAE Review in FY09 for two different industry teams, and includes Government Furnished Equipment (GFE) for ships systems, Final System Design (FSD), Detail Design, and Mission Systems and Ship Integration Team (MISST), and Outfitting and Post Delivery.

	LCS 1	LCS 2
BCC	521.0	557.0
Change Orders	0.5	3.5
Other	3.5	7.5
GFE	12.0	7.0
Total End Cost	537.0	575.0
FSD/MSSIT	25.0	54.0
OF/PD	75.0	75.0
Total	637.0	704.0

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Construction	94.386	63.453	0.000
RDT&E Articles Quantity	0	0	0

Provides for the construction, production, test and trial of LCS 1 and LCS 2 ships, including execution of Change Orders and procurement of Government Furnished Equipment (GFE).

FY2008: Continued detail design and construction of LCS 1 (Lockheed Martin Design) and LCS 2 (General Dynamics - Bath Iron Works Design). Completed procurement of GFE for both LCS 1 and LCS 2. Support and execute the ship pre-delivery test and trials and related certification efforts.

FY2009: Funds continued construction efforts for LCS 1 and LCS 2

	FY 2008	FY 2009	FY 2010
Outfitting and Post Delivery	27.501	22.464	75.460
RDT&E Articles Quantity	0	0	0

Provides for the integration and testing of the sea frame and separately acquired mission packages, implementation of instrumentation packages and validation of structural, seakeeping, hydrodynamic performance, emergent support during the execution of PDT&T, post-shakedown availability (PSA) to incorporate Engineering Change Proposals that allow for correction of trial card deficiencies, and mission critical upgrades, as required.

FY 2008: Complete procurement of LCS 1 and LCS 2 spare and repair parts for shipboard equipment, shipboard equipage and tools, consumables, HAZMAT and other materials, and medical space items, including medical supplies. Complete procurement of shipboard maintenance equipment. Initiate instrumentation installation and integration. Complete detailed test plans and conduct Test Readiness Reviews (TRR). Perform engineering, planning and procurement of long lead material for the Industrial Post Delivery Availabilities (IPDA), scheduled immediately after ship delivery.

FY 2009: Initiate operation of installed instrumentation equipment, collection of data and the analysis of critical ship performance parameters. Conduct testing of mission packages, seaframe, and the integrated product. Conduct Combat Systems Ship Qualification Trials (CSSQT) testing of Seaframes and mission packages. Perform emergent repairs during PDT&T as required. Perform engineering, planning, work package development and procurement of long lead material for the Post-Shakedown Availabilities (PSA) for both LCS 1 and LCS 2. Conduct IPDA's for LCS 1 and 2 to correct trial card deficiencies and incorporate critical safety and mission critical ECP's that must be completed prior to delivery to the Fleet.

FY 2010: Perform emergent repairs to support Post Delivery Test and Trials. Conduct final contract trials and provide technical support for the INSURV Board. Correct Trial Card discrepancies. Perform advance planning, engineering, work package development and the procurement of material to support two fourteen week industrial Post Shakedown Availability (PSA) to include both LCS 1 and LCS 2. Execute the PSA for both LCS 1 and LCS 2. Complete instrumentation, data collection and analysis of critical ship performance.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**	

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
BLI 1600 (OPN)	0.000	73.684	137.259						210.943
BLI 2127 (SCN)	0.106	1,016.952	1,380.000						2502.952
BLI 4221 (WPN)	0.000	2.778	0.000						2.778
BLI 0443 (APN)	37.432	50.189	77.616						165.237
BLI 1B4B/14B50 (O&MN)	7.885	11.854	9.296						29.035
BLI 1B5B/15BR0 (O&MN)	22.562	24.804	20.737						68.103
BLI 1C1C/11C70 (O&MN)	0.000	1.551	1.746						3.297

D. ACQUISITION STRATEGY:

The LCS Program takes an evolutionary approach to acquisition that emphasizes completion of two initial Seaframe designs, the LCS Flight 0 Class ships, by two industry teams. The incorporation of lessons learned from the design, construction, and testing of the first two ships, as well as introduction of improved waterjets on both designs and a waterjet tunnel extension on the LM LCS design will comprise the Flight 0+ baseline to be awarded in FY09 and FY10. The LCS Program Acquisition Strategy uses a limited competition approach for existing industry teams to compete for the construction of Flight 0+ Class Ships in FY09 through FY10.
The LCS Program will concurrently initiate Class Design Services contracts to both industry design teams for development of a Navy Design Package.

The LCS Program achieved Milestone A and Program Initiation in May 2004, and conducted a Defense Acquisition Executive (DAE) review in FY09. Milestone B has been planned beyond FY10.

E. MAJOR PERFORMERS:

Major Contractors:
General Dynamics - Bath Iron Works, Bath, ME
Austal USA, Mobile, AL
Lockheed Maritime Systems and Sensors, Moorestown, NJ
Marinette Marine Corporation, Marinette, WI
Bollinger Shipyards, LA

Government Field Activities:

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**

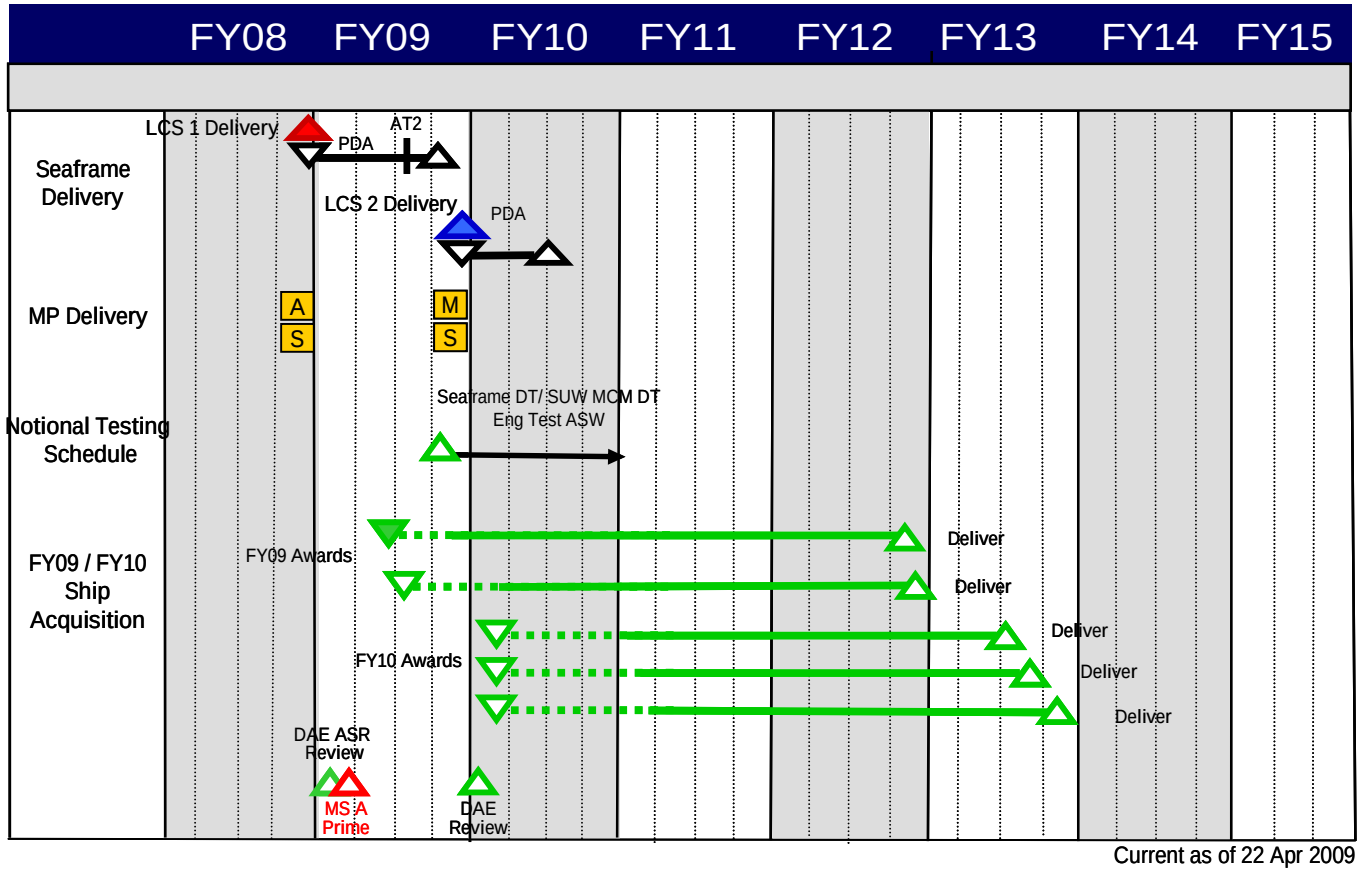
NSWC Dahlgren, Dahlgren, VA
NSWC Carderock, Philadelphia, PA
Space and Naval Warfare Command (SPAWAR), Charleston, SC
NSWC/Port Hueneme, Port Hueneme, CA

Universities:
Johns Hopkins University Applied Physics Lab, Laurel, MD

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**					PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**					
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
LCS Ship 1 Construction	Comp	Lockheed Martin	502.000			19.000		0.000			521.000	0.000
LCS Ship 1 Change Orders	Comp	Lockheed Martin	0.500			0.000		0.000			0.500	0.000
LCS Ship 1 GFE	Comp	Lockheed Martin	12.000			0.000		0.000			12.000	0.000
LCS Ship 2 Construction	Comp	General Dynamics	512.847			44.153		0.000			557.000	0.000
LCS Ship 2 Change Orders	Comp	General Dynamics	3.500			0.000		0.000			3.500	0.000
LCS Ship 2 GFE	Comp	General Dynamics	7.000			0.000		0.000			7.000	0.000
LCS Ship 1 FSD/MSSIT	Comp	Lockheed Martin	25.000			0.000		0.000			25.000	0.000
LCS Ship 2 FSD/MSSIT	Comp	General Dynamics	54.000			0.000		0.000			54.000	0.000
Subtotal Product Development			**1,116.847**			**63.153**		0.000			**1,180.000**	**0.000**
Other Program Costs	Various	Various	11.000			0.000		0.000			11.000	0.000
Travel	PD	SUPSHIPS	0.160			0.300		0.000			0.460	0.000
Subtotal Support Costs			**11.160**			**0.300**		0.000			**11.460**	**0.000**
Remarks:												
Subtotal Management Services			**0.000**			**0.000**		**0.000**			**0.000**	**0.000**
Remarks:												
Initial Outfitting / ISP	Various	Various	21.601			0.000	VAR	0.000			21.601	0.000
Testing and Logistics	WX	NSWC (Various)	18.948			6.000	VAR	4.000			28.948	0.000
Post Delivery ECP's	Comp	LM/GD	3.200			16.000	VAR	25.000	VAR		44.200	0.000
PSA/PSA Planning/INSURV/OPTAR	PD	Supship (Various)	4.591			0.464	VAR	46.460	VAR		51.515	0.000
Subtotal Outfitting / Post Delivery			**48.340**			**22.464**		**75.460**			**146.264**	**0.000**
Remarks:												
Total Cost			**1,176.347**			**85.917**		**75.460**			**1,337.724**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**	PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**

Acquisition Schedule



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603581N/LITTORAL COMBAT SHIP (LCS)**			PROJECT NUMBER AND NAME **4018/Littoral Combat Ship Construction**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Detail Design and Construction - Flight 0	1Q-4Q	1Q-4Q					
LCS 1 Delivery (Flight 0)	4Q						
LCS 2 Delivery (Flight 0)		4Q					

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603581N/LITTORAL COMBAT SHIP (LCS)**	**9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010	
9821A/ Remote Operation of Active Sonar Technology	2.319	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

Funding is for efforts to optimize active Sonar operating depth and source transmission to achieve the best acoustic coverage for the mission area and target scenario, based on the available source transmission and receiver processing characteristics in support of the ASW Mission Package.

	FY 2008	FY 2009	FY 2010	
9B84A/ASW CONTACT MANAGEMENT MISSION PLANNING IMPROVEMENT	2.699	0.000	0.000	
RDT&E Articles Quantity	0	0	0	

Funding to provide a robust ASW fused-data mission planning and in-situation execution decision aid capability for a multi-platform, network-based system-of-systems. This would allow for a capability to assimilate, evaluate, fuse, and provide situational awareness with rapid re-planning capability to Fleet Commanders and tactical operators

	FY 2008	FY 2009	FY 2010	
9B86A/LCS MISSION PACKAGE ENTERPRISE	3.862	0.000	0.000	
RDT&E Articles Quantity	0	0	0	

This funding initiative will extend the process across the Enterprise and conduct coordinated "build-test-build" spiral testing for LCS Mission Packages and embarked off board platforms. The focus will be on proactively executing technology innovation transitions, assessing operational effectiveness improvements and managing the risks involved through regularly scheduled at sea evaluations.

	FY 2008	FY 2009	FY 2010	
9B87A/NEW PAYLOADS AND SENSORS UNMANNED SURFACE VEHICLE SYSTEM	1.552	0.000	0.000	
RDT&E Articles Quantity	0	0	0	

Funding to design, produce and test modular USV subsystems and autonomy on existing USVs. Modularity will reduce cost and schedule to integrated new payloads while improved autonomy will enable future concept of operation for USVs.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603581N/LITTORAL COMBAT SHIP (LCS)**	**9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010	
9D41A/Autonomous Acoustic Array Advanced Tubular Solid Oxide Fuel Cell	0.000	1.995	0.000	
RDT&E Articles Quantity	0	0	0	

Funding to design, produce and test modular USV subsystems and autonomy on existing USVs. Modularity will reduce cost and schedule to integrated new payloads while improved autonomy will enable future concept of operation for USVs.

	FY 2008	FY 2009	FY 2010	
9D42A/LCS Common MIssion Package Training Environment	0.000	4.488	0.000	
RDT&E Articles Quantity	0	0	0	

Funding is provided to accelerate the development of a common Mission Package Trainer to meet near term MCM Mission Package training requirements.

	FY 2008	FY 2009	FY 2010	
9D43A/AIternative Use of Mine Warfare Modules	0.000	3.790	0.000	
RDT&E Articles Quantity	0	0	0	

Funding to provide a robust ASW fused-data mission planning and in-situation execution decision aid capability for a multi-platform, network-based system-of-systems. This would allow for a capability to assimilate, evaluate, fuse, and provide situational awareness with rapid re-planning capability to Fleet Commanders and tactical operators

CLASSIFICATION:	UNCLASSIFIED			
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION				DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603582N/COMBAT SYSTEM INTEGRATION**		
COST (In Millions)		FY 2008	FY 2009	FY 2010
Total PE Cost		52.316	64.172	22.558
0164 / COMBAT SYSTEM INTEGRATION		50.773	64.172	22.558
9999 / CONGRESSIONAL ADDS		1.543	0.000	0.000

A. MISSION DESCRIPTION:

Project 0164: Combat System Integration:

COMNAVSEASYSCOM (SEA 05W) is assigned central Navy responsibility for interoperability, directing the development of policy and architecture for Strike Force (SF) warfare systems engineering and implementation of a common warfare systems engineering process. Furthermore, SEA 05W provides top level direction and execution for certification and assessments which support capability and quality for ships and submarines. SEA 05W has developed processes and tools including the establishment of a force-level warfare systems engineering process, stewardship of the introduction of Combat Systems Command, Control, Computers, Communications and Intelligence (C5I) modernization and improvement into the Fleet Response Plan (FRP), Command & Control, Communications, Computers, & Combat Systems Installation Master Plan (C5IMP) process, configuration management and certification processes, and force-level interoperability assessments using the Distributed Engineering Plant (DEP) land-based testing tool. This project funds the core elements required to conduct Warfare Systems Integration and Interoperability Testing (WSI2T) in accordance with the Naval Warfare Systems Certification Policy (NWSCP), Joint NAVSEA, NAVAIR, and SPAWAR SYSCOM Instruction.

This project funds SF configuration management through the FRP, shore based testing and WSI2T certification of operational computer systems in a test environment similar to their ultimate shipboard operational environment, and Interoperability Assessments (IA) which are a prerequisite for operational certification of the ships in SF configurations prior to their deployment. Force Certification of deploying ships in SF configurations is accomplished through the utilization of the Navy's DEP, which provides operational configurations for all Naval combat systems located at multiple Navy land-based sites located across the country and connected via Asynchronous Transfer Mode (broadband switching and transmission technology, ATM) networking technology. The DEP provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and battle group units. It is a U. S. Fleet Forces Command requirement that all SFs undergo IA testing in the DEP prior to deployment. Further, the DEP provides the mechanism to support the Navy's participation in the Joint testing environments as well as the coalition forces through the Combined Forces Battle Laboratories (CFBL) network to allow for assessments of both Joint and Coalition interoperability. Program focus in FY10 shifts from legacy systems to new systems and platforms under development.

As the Navy embarks on Navy Open Architecture (OA), Common Network Interface (CNI) has been selected for upgrade on the LHA, LHD, and LSD ship classes. CNI is an open interface system that modernizes legacy amphibious ships that support the Expeditionary Strike Group (ESG). CNI uses Commercial Off The Shelf (COTS) hardware and common interoperable software compliant with the Navy's OA standards to integrate the data from ship's sensors, external links, and FORCEnet sources into an operational picture to the warfighter. CNI provides rapid operational capability upgrades via a Rapid Capability Insertion Process (RCIP) using primarily software upgrades. CNI allows for the implementation of the

Integrated Architecture Behavior Model (IABM), FORCEnet and Network centric connectivity by providing the necessary fleet support activities which include: systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.

The Navy has also approved the Amphibious Air Warfare (AAW) and Amphibious Improvement Program (AIP) which will integrate Close-In Weapon System (CIWS) radar into the combat system. This is a significant change in how the combat system operates and requires modification of existing test beds to prove this concept and certify it for development. Additional capabilities that also require certification for deployment are Adaptive Engage Control (AEC), next generation Command and Control Processor (C2P) with Joint Range Extension (JRE) and the introduction of Mode 5.

The Navy, through Automated Test and Retest (ATRT), is developing an automated test capability applicable at each phase of software development that provides reproducible, quantitative evaluation of software performance in a cost and time effective manner. ATRT capability will enable acceleration for testing and re-testing of open architecture software and reinforce a requirement to expedite software implementations and upgrades. ATRT implementations target AEGIS Combat System and the Joint Single Integrated Air Picture (SIAP) Programs within development and the Ship Self Defense System (SSDS) Program within production to demonstrate savings for test and evaluation evolutions throughout the acquisition lifecycle.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	53.872	54.401	40.257
FY10 President's Budget	52.316	64.172	22.558
Total Adjustments	-1.556	9.771	-17.699
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	9.826	0.000
SBIR/STTR/FTT Assessment	-0.487	0.000	0.000
Program Adjustments	-1.069	-0.023	-17.529
Rate/Misc Adjustments	0.000	-0.032	-0.170
Total	-1.556	9.771	-17.699

C. OTHER PROGRAM FUNDING SUMMARY:

Related RDT&E: Computer programs developed under these programs are tested in their integrated configuration.

PE 0204571N (Consolidated Training Systems Development)

PE 0205620N (Surface ASW Combat System Technology)

PE 0603382N (Advanced Combat System Technology)

PE 0603755N (Ship Self Defense Dem/Val)

PE 0603658N (Cooperative Engagement)

PE 0604307N (AEGIS Combat Systems Engineering)

PE 0604755N (Ship Self Defense - EMD)

PE 0604518N (Combat Information Center Conversion)

PE 0603879N (Single Integrated Air Picture (SIAP) System Engineering (SE)

Related Procurement:

Line Item No. and Name	FY 2008	FY 2009	FY 2010	Total Cost
OPN 296000 (ICSTF/DEP): Integrated Combat System Test Facilities/Distributed Engineering Plant	4.349	4.545	4.423	13.317

D. ACQUISITION STRATEGY:

RDTEN funding under this line supports independent certification of the integration of major capability upgrades acquired by Program Executive Offices (PEOs) into host Navy Platforms and Strike Forces. The RDTEN engineering and certification activities at field sites does not involve direct procurement of equipment or engineering services, and hence no acquisition strategy is required. The major capability upgrades evaluated under this program fall under their associated PEOs' acquisition strategies.

E. MAJOR PERFORMERS:

Naval Surface Warfare Center - Distributed Engineering Plant (DEP), Strike Force Interoperability Requirements (SFIR) and Platform/Strike Force Certification efforts.

General Dynamics - Advanced Information Systems (GD-AIS) Digital Systems Resources, Inc. (DSR), Fair Lakes, VA- Prime contractor for Common Network Interface (CNI).

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**		PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	50.773	64.172	22.558
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Project 0164: Combat System Integration:

COMNAVSEASYSCOM (SEA 05W) is assigned central Navy responsibility for interoperability, directing the development of policy and architecture for Strike Force (SF) warfare systems engineering and implementation of a common warfare systems engineering process. Furthermore, SEA 05W provides top level direction and execution for certification and assessments which support capability and quality for ships and submarines. SEA 05W has developed processes and tools including the establishment of a force-level warfare systems engineering process, stewardship of the introduction of Combat Systems Command, Control, Computers, Communications and Intelligence (C5I) modernization and improvement into the Fleet Response Plan (FRP), Command & Control, Communications, Computers, & Combat Systems Installation Master Plan (C5IMP) process, configuration management and certification processes, and force-level interoperability assessments using the Distributed Engineering Plant (DEP) land-based testing tool. This project funds the core elements required to conduct Warfare Systems Integration and Interoperability Testing (WSI2T) in accordance with the Naval Warfare Systems Certification Policy (NWSCP), Joint NAVSEA, NAVAIR, and SPAWAR SYSCOM Instruction.

This project funds SF configuration management through the FRP, shore based testing and WSI2T certification of operational computer systems in a test environment similar to their ultimate shipboard operational environment, and Interoperability Assessments (IA) which are a prerequisite for operational certification of the ships in SF configurations prior to their deployment. Force Certification of deploying ships in SF configurations is accomplished through the utilization of the Navy's DEP, which provides operational configurations for all Naval combat systems located at multiple Navy land-based sites located across the country and connected via Asynchronous Transfer Mode (broadband switching and transmission technology, ATM) networking technology. The DEP provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and battle group units. It is a U. S. Fleet Forces Command requirement that all SFs undergo Interoperability Assessment testing in the DEP prior to deployment. Further, the DEP provides the mechanism to support the Navy's participation in the Joint testing environments as well as the coalition forces through the Combined Forces Battle Laboratories (CFBL) network to allow for assessments of both Joint and Coalition interoperability. Program focus in FY10 shifts from legacy systems to new systems and platforms under development.

As the Navy embarks on Navy Open Architecture (OA), Common Network Interface (CNI) has been selected for upgrade on the LHA, LHD, and CNI is an open interface system that modernizes legacy amphibious ships that support the Expeditionary Strike Group (ESG). CNI uses Commercial Off The Shelf (COTS) hardware and common interoperable software compliant with the Navy's OA standards to integrate the data from ship's sensors, external links, and FORCEnet sources into an operational picture to the warfighter. CNI provides rapid operational capability upgrades via a Rapid Capability Insertion Process (RCIP) using primarily software upgrades. CNI allows for the implementation of the Integrated Architecture Behavior Model (IABM), FORCEnet and Network centric connectivity by providing the necessary fleet support activities which include: systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**	PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**

The Navy has also approved the Amphibious Air Warfare (AAW) and Amphibious Improvement Program (AIP) which will integrate Close-In Weapon System (CIWS) radar into the combat system. This is a significant change in how the combat system operates and requires modification of existing test beds to prove this concept and certify it for development. Additional capabilities that also require certification for deployment are Adaptive Engage Control (AEC), next generation Command and Control Processor (C2P) with Joint Range Extension (JRE) and the introduction of Mode 5.

The Navy, through Automated Test and Re-Test (ATRT), is developing an automated test capability applicable at each phase of software development that provides reproducible, quantitative evaluation of software performance in a cost and time effective manner. ATRT capability will enable acceleration for testing and re-testing of open architecture software and reinforce a requirement to expedite software implementations and upgrades. ATRT implementations target AEGIS Combat System and the Joint Single Integrated Air Picture (SIAP) Programs within development and the Ship Self Defense System (SSDS) Program within production to demonstrate savings for test and evaluation evolutions throughout the acquisition lifecycle.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**	PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Strike Force Requirements Engineering and Analysis (SF)	2.600	3.000	0.000
RDT&E Articles Quantity	0	0	0

This program maps current interoperability requirements to new ships, such as CVN 21, DDG 1000 and LCS. In FY08, the program implemented multi-mission scenarios and interoperability test requirements, evaluated interoperability performance, and advised the Fleet of critical interoperability capabilities and limitations. Implementation of these standards is essential to evaluate emerging combat system capabilities, such as in CG/DDG modernization, LCS and CVN 21.
In FY09, will conduct the same level of effort for multi-mission scenarios and interoperability test requirements, evaluate interoperability performance, and advise the Fleet of critical interoperability capabilities and limitations.

	FY 2008	FY 2009	FY 2010
Platform/Strike Force Certification	15.000	15.510	11.649
RDT&E Articles Quantity	0	0	0

This program conducts Interoperability Assessments (IA) in support of the Naval Warfare System Certification Plan (NWSCP) using the Distributed Engineering Plant (DEP).
FY08: three (3) Systems Engineering Events (SEEs) were conducted for root-cause determination of key interoperability problems and to support development of new force-level warfare system capabilities such as Shipboard Gridlock System (SGS), Fleet requirements and Global Command and Control System (GCCS). Four (4) IAs were conducted for Cruiser Modernization, Ship Self Defense System (SSDS) platforms, AEGIS Weapon System (AWS) 7.1R and CVN 68 Open Architecture (OA).
FY09: will conduct the same level of effort for IA testing while expanding the number of SEE events from three (3) to five (5) in order to continue support for GCCS, SGS, Fleet and other associated programs under development.
FY10: the program will support two (2) IAs (new ships have priority) and no SEEs.

	FY 2008	FY 2009	FY 2010
Fleet Response Plan (FRP)	7.470	8.001	4.240
RDT&E Articles Quantity	0	0	0

FY08: efforts continued implementation of the Fleet Response Plan (FRP) by providing support from the Strike Force (SF) Interoperability Teams which included On-Site-Reps, Project Engineers, Fleet Liaisons, and Strike Force Interoperability Officers (SFIOs). The program supported FRP milestones related to the Command Control Communication Computer and Combat Systems Modernization Process (C5IMP).
FY09: efforts focused on transitioning work to support minimum sustainability of Capabilities and Limitations (C&L) documentation. FY09 efforts decreased evaluation from 27 originally planned to 14 Strike Groups within the D-6 window in order to continue development and distribution of Strike Group C&L documentation. This includes support to meet Emergency Surge, Surge, Normal Deployment, and includes Center for Surface Combat Systems (CSCS) training events with updated material from documented findings/results of underway and Interoperability Certification test events.
FY10: the program will support SFIOs.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**	PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**

	FY 2008	FY 2009	FY 2010
Combat Systems Certification In Support of Platform Certification	4.800	5.500	2.169
RDT&E Articles Quantity	0	0	0

FY08: Certification efforts included 11 Warfare System Integration and Interoperability Testing (WSI2T) events, 14 Platform Certification Decisions (PCDs) and 9 Initial Platform Certification Decisions (IPCDs). Additional FY08 testing was conducted for Common Data Link Management System (CDLMS-3.X-4), SSDS Engineering Updates (EUs) 1-5, Adaptive Engagement Control (AEC) Retest, NAVSSI GPS VME Receiver Card (GVRC), and NAVSSI 30 second Satellite Patch.
FY09: the program will conduct 9 WSI2Ts, 11 PCDs and 11 IPCDs.
FY10: the program will continue planning for out-year testing.

	FY 2008	FY 2009	FY 2010
Navigation System Certification (NAVCERT)	0.000	1.500	1.500
RDT&E Articles Quantity	0	0	0

NAVSEAINST 9420.4, dated May 02 requires that a Navigation System Certification (NAVCERT) be performed as a result of: initial installation/new construction, major system overhaul/modification/repair when it is determined to impact the accuracy of navigation data, changes to the navigation baseline configuration, or elapsed time of more than five (5) years since previous NAVCERT. A NAVCERT certifies to NAVSEA, Ship Program Managers (SPMs), Type Commanders (TYCOMs), and Fleet that the Shipboard Navigation Systems are: properly installed and in good physical condition, operating to specified accuracy and requirements under both dockside (static) and at-sea (dynamic) conditions, calibrated and operating to required performance specifications, and that analog and digital navigation data is transmitted and received within specified limits to all shipboard users, specifically Combat, aircraft landing and weapon systems. A successful NAVCERT, indicating the Integrated Navigation Suite is certified, is required for Platform Certification Decision (PCD) Milestones and Tactical Tomahawk Weapons Control System (TTWCS), Precision Approach and Landing System (PALS), and the Electronic Charting and Display System (ECDIS-N) Certification Test Program. Fleet Message CNSF 211506Z, dated Nov 05, highlights the need to validate safety of navigation as critical to assurance of operational readiness.

FY09: 31 ships require NAVCERT, specifically 20 CRUDES, five (5) aircraft carriers, and six (6) amphibious ships.
FY10: 27 ships require NAVCERT, specifically 21 CRUDES, two (2) aircraft carriers, and four (4) amphibious ships.

	FY 2008	FY 2009	FY 2010
DEP Engineering and Operations	7.353	7.161	3.000
RDT&E Articles Quantity	0	0	0

Performs systems engineering, and operations functions to ensure Distributed Engineering Plant (DEP) infrastructure supports testing of combat system baselines. The program conducts systems engineering to identify simulation/stimulation requirements necessary to achieve required fidelity for DEP testing at Navy laboratory sites through verification, validation and accreditation (VV&A).
FY08: Corona network bandwidth was upgraded to help decrease transfer time and the Defense Information System Network (DISN) was transferred from commercial to government circuits.
FY09: new projected nodes include upgrading Surface Combat Systems Center (SCSC) node into a full node and adding one (1) new node to support LCS. In FY10, nodes that have legacy baselines will no longer be supported in order to accommodate new nodes.
FY10: the program will support one VV&A event.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**	PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**	

	FY 2008	FY 2009	FY 2010
ATRT Automated Test and Re-Test	0.000	10.000	0.000
RDT&E Articles Quantity	0	0	0

Automated Test and Re-Test (ATRT) Capability implementations target AEGIS Combat System the Joint Single Integrated Air Picture (SIAP) Programs within development and the Ship Self Defense System (SSDS) Program within production to demonstrate savings for test and evaluation evolutions throughout the acquisition lifecycle.

FY09 Plan: Targeted demonstrations for AEGIS Combat Systems, SIAP and SSDS to demonstrate capability and savings for test evolutions throughout the acquition lifecycle.

	FY 2008	FY 2009	FY 2010
CNI/OA Transformation Roadmap	13.550	13.500	0.000
RDT&E Articles Quantity	0	0	0

Common Network Interface/ Open Architecture (CNI/OA) Transformation Roadmap

FY08 Plan: Continue systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.

FY09 Plan: Continue systems engineering support, software support, and integrated logistics support (ILS) to ensure proper coordination and connectivity of hardware and software components for accurate operation.

CLASSIFICATION:	UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**			PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**				
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
SF Requirements Engineering & Analysis	WX/RX/PD	Various NSWCs	3.657	1.500	OCT-08	0.000	OCT-09	5.157	0.000
SF Requirements Engineering & Analysis	WX/RX/PD	Various Non-NSWCs	3.795	1.500	OCT-08	0.000	OCT-09	5.295	0.000
Platform/Strike Force Certification	WX/RX/PD	Various NSWCs	20.550	6.000	OCT-08	6.000	OCT-09	32.550	0.000
Platform/Strike Force Certification	WX/RX/PD	Various Non-NSWCs	13.097	7.510	OCT-08	4.049	OCT-09	24.656	0.000
Fleet Response Plan (FRP)	WX/RX/PD	Various NSWCs	15.401	6.811	OCT-08	3.240	OCT-09	25.452	0.000
Fleet Response Plan (FRP)	WX/RX/PD	Various Non-NSWCs	1.050	0.200	OCT-08	1.000	OCT-09	2.250	0.000
Combat Systems Cert ISO Platform Cert	WX/RX/PD	Various NSWCs	15.055	5.000	OCT-08	2.169	OCT-09	22.224	0.000
Combat Systems Cert ISO Platform Cert	WX/RX/PD	Various Non-NSWCs	1.883	0.000	N/A	0.000	N/A	1.883	0.000
Navigation System Certification	WX/RX/PD	Various NSWCs	0.000	1.500	OCT-08	1.500	OCT-09	3.000	0.000
DEP Engineering and Operations	WX/RX/PD	Various NSWCs	10.371	3.190	OCT-08	1.200	OCT-09	14.761	0.000
DEP Engineering and Operations	WX/RX/PD	Various Non-NSWCs	7.362	3.561	OCT-08	1.200	OCT-09	12.123	0.000
CNI/Design Agent	CPAF	General Dynamics	38.626	9.300	N/A	0.000	N/A	47.926	0.000
CNI/Software Engineering	WX/RX/PD	NSWC Dahlgren	6.383	2.000	N/A	0.000	N/A	8.383	0.000
CNI/Test and Evaluation	WX/RX/PD	CDSA	2.922	1.000	N/A	0.000	N/A	3.922	0.000
CNI/Systems Engineering	WX/RX/PD	NSWC PHD	2.145	0.500	N/A	0.000	N/A	2.645	0.000
CNI/Miscellaneous	WX/RX/PD	VARIOUS	6.829	0.700	N/A	0.000	N/A	7.529	0.000
OA Automated Test and Retest	WX/RX/PD	Various NSWCs	8.500	10.000	N/A	0.000	N/A	18.500	0.000
Contract Engineering Support	VARIOUS	VARIOUS	8.459	2.000	NOV-08	1.000	NOV-09	11.459	0.000
Contract Program Management Support	VARIOUS	VARIOUS	4.041	1.600	NOV-08	1.000	NOV-09	6.641	0.000
Travel	PD	NAVSEA TRAVEL	0.850	0.300	SEP-09	0.200	SEP-10	1.350	0.000
Interoperability Fixes	WX/RX/PD	Various NSWCs	1.500	0.000	N/A	0.000	N/A	1.500	0.000
Subtotal Product Development			**172.476**	**64.172**		**22.558**		**259.206**	**0.000**

Remarks:

NAVSEA implemented standard document issuance to streamline and reduce the number of documents executed which was approved by FMB and OMB. Forms explained below:

WX: WR & RCP Combination

RX: RCP

PD: Program Directive

WX: Form 2276A

Total Cost	**172.476**	**64.172**		**22.558**		**259.206**	**0.000**

EXHIBIT R-4, SCHEDULE PROFILE

DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDTEN/BA 4	0603582N/COMBAT SYSTEM INTEGRATION	0164/R4 Page 2 Combat System Integration

Fiscal Year	2008				2009				2010			
AWS 7.1C Interop Assessment Test (Unfunded)		2				2						
DDG (M) Interop Assessment Test						2						
LCS 2 WSI2T							3	4				
CVN 68 Interop Assessment Test			3							2	3	
CVN 73 WSI2T											3	
CVN 75 WSI2T											3	4
CVN 69 WSI2T										2	3	
SEE -01	1					2						
SEE -02		2					3					
SEE -03				4				4				
LSD 41/49 WS2IT						2	3					
LHA 5 WSI2T			3	4								
AEGIS BMD			3									
FFG Level 13 WSI2T			3				3					
LHD 8 WSI2T						2	3					
CVN 76 WSI2T						2	3					

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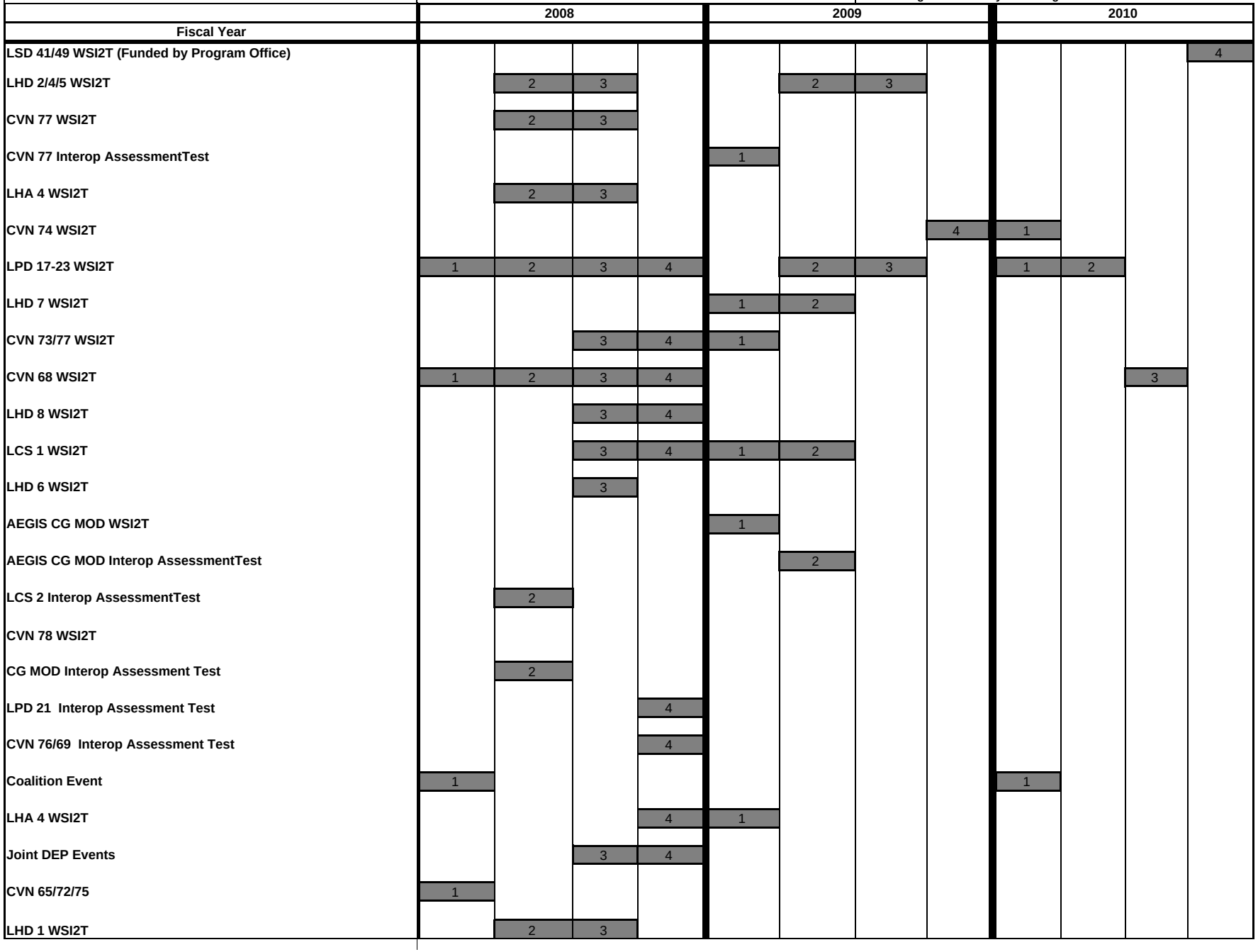
CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4, SCHEDULE PROFILE			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603582N/COMBAT SYSTEM INTEGRATION	PROJECT NUMBER AND NAME 0164/R4 Page 2 Combat System Integration	



CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4a, SCHEDULE DETAIL			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**		PROJECT NUMBER AND NAME **0164/COMBAT SYSTEM INTEGRATION**

Schedule Profile	FY 2008	FY 2009	FY 2010
AWS 7.1C Interop Assessment Test (Unfunded)	2Q	2Q	
DDG (M) Interop Assessment Test		2Q	
LCS 2 WSI2T		3Q, 4Q	
CVN 68 Interop Assessment Test	3Q		2Q, 3Q
CVN 73 WSI2T			3Q
CVN 75 WSI2T			3Q, 4Q
CVN 69 WSI2T			2Q, 3Q
SEE - 01	1Q	2Q	
SEE - 02	2Q	3Q	
SEE - 03	4Q	4Q	
LSD 41/49 WSI2T		2Q, 3Q	
LHA 5 WSI2T	3Q, 4Q		
AEGIS BMD	3Q		
FFG Level 13 WSI2T	3Q	3Q	
LHD 8 WSI2T		2Q, 3Q	
CVN 76 /69WSI2T		2Q, 3Q	

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4a, SCHEDULE DETAIL			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**		PROJECT NUMBER AND NAME **0164/R4 Page 2 Combat System Integration**

Schedule Profile	FY 2008	FY 2009	FY 2010
LSD 41/49 WSI2T (Funded by Program Office)			4Q
LHD 2/4/5 WSI2T	2Q,3Q	2Q,3Q	
CVN 77 WSI2T	2Q,3Q		
CVN 77 Interop Assessment Test		1Q	
LHA 4 WSI2T	2Q,3Q		
CVN 74 WSI2T		4Q	1Q
LPD 17-23 WSI2T	1Q,2Q,3Q,4Q	2Q,3Q	1Q, 2Q
LHD 7 WSI2T		1Q,2Q	
CVN 73/77 WSI2T	3Q, 4Q	1Q	
CVN 68 WSI2T	1Q,2Q,3Q,4Q		3Q
LHD 8 WSI2T	3Q,4Q		
LCS 1 WSI2T	3Q,4Q	1Q,2Q	
LHD 6 WSI2T	3Q		
AEGIS CG MOD WSI2T		1Q	
AEGIS CG MOD Interop Assessment Test		2Q	
LCS 2 Interop Assessment Test	2Q		
CVN 78 WSI2T			
CG MOD Interop Assessment Test	2Q		
LPD 21 Interop Assessment Test	4Q		
CVN 76/69 Interop Assessment Test	4Q		
Coalition Event	1Q		1Q
LHA 4 WSI2T	4Q	1Q	
Joint DEP Events	3Q,4Q		
CVN 65/72/75 WSI2T	1Q		
LHD 1 WSI2T	2Q,3Q		

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603582N/COMBAT SYSTEM INTEGRATION**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9B88A Automated Test and Re-Test Capability	1.543	0.000	0.000
RDT&E Articles Quantity	0	0	0

Congressional add funds to support software engineering upgrades to enable rapid test and re-test of open architecture software modules and associated improvements.
Beginning in FY08, funding is being utilized to define and develop the methodology for automating the test of Combat Systems. The maturing of this effort intends to transition the programming of Automated Testing and Re-Testing (ATRT) capability by FY10.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603609N/CONVENTIONAL MUNITIONS**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	7.018	8.087	3.458				
0363 / Insensitive Munitions Adv. Development	2.893	2.482	3.458				
1821 / Conventional Fuzed Warfare Package	2.573	4.715	0.000				
2299 / Non-Nuclear Expendable Ordnance	1.552	0.890	0.000				

A. MISSION DESCRIPTION:

Insensitive Munitions Advanced Development (IMAD) (Project 0363): Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet or fragment impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. IMAD is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuses and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship and platform survivability and satisfying performance and readiness requirements.

Conventional Fuzed Warhead Package (Project 1821): The Navy requires improved lethality of air and surface launched ordnance to defeat advanced threats. This is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology to meet this requirement. This program is a significant vehicle for orderly planning, and timely and effective transition of Navy 6.2 and 6.3A investments to Engineering and Manufacturing Development (E&MD) phase missile/weapon systems. This program addresses increased lethality against current and emerging threats, and is responsive to all mission areas -- anti-air, strike, defense suppression, theater defense and ship defense -- and supports development of complete ordnance sections. The current on-going projects address significant technology advancements for missile systems by developing mature physical concepts to enhance anti-air kill probability, advanced ordnance with augmented overland cruise missile defense and theater ballistic missile defense capabilities, and advanced seeker technology and development and incorporation of Software Guidance Integrated Fuzing - S/W GIF. The program supports the full spectrum of missile advanced development and technology improvements and in future years will continue to provide the vehicle to address emergent requirements by transitioning mature development efforts into weapon systems with minimal technical and financial risk.

Non-Nuclear Expendable Ordnance (NNEO) (Project 2299): This item addresses improvements to Navy surface launched (2T) NNEO.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603609N/CONVENTIONAL MUNITIONS**

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	8.760	8.124	8.372
FY10 President's Budget	7.018	8.124	3.502
Total Adjustments	-1.742	0.000	-4.870
(U) Summary of Adjustments			
Program Adjustments	-1.742		-4.870
Total	-1.742	0.000	-4.870

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**				PROJECT NUMBER AND NAME **0363/Insensitive Munitions Adv. Development**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	2.893	2.482	3.458				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock and bullet impact, thus presenting a great hazard to ships, aircraft and personnel. This program will provide, validate and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. The Insensitive Munitions (IM) Program is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuses and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship survivability and satisfying performance and readiness requirements. Each technology area is divided into subtasks addressing specific munition/munition class IM deficiencies. Energetic materials producibility is demonstrated to assure national capability to produce and load munitions systems. The program leverages are being closely coordinated with other Military Departments,North Atlantic Treaty organization (NATO)and allied countries to eliminate redundant efforts and maximize efficiency. A joint service IM requirement has been developed and through the IM Strategic Planning process, all PEO's are implementing IM in their priority munitions. Insensitive munitions are identified as a DoD critical technology requirement and considered as part of a weapon design. The IMAD program matures the technology developed by a variety of Science and Technology (S&T) sources for program management integration into weapons systems to meet the IM technical deficiencies documented in the PEO IM Strategic Plans. IMAD provides the link between S&T programs and the PMs by optimizing IM technologies to meet Navy requirements. IMAD offers risk mitigation for the PMs in terms of IM technical knowledge, expertise and manpower with the State of the Art expertise across IM products. Each technology area is divided into subtasks addressing specific munition and munition class IM deficiencies.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**	PROJECT NUMBER AND NAME **0363/Insensitive Munitions Adv. Development**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.694	0.600	0.618
RDT&E Articles Quantity	0	0	0

Validate and assess weapon systems POA&M's for IM compliance. Compile and analyze weapon system, energetic material and generic technology IM test data.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.800	0.530	0.866
RDT&E Articles Quantity	0	0	0

Demonstrate high explosives that show improved IM characteristics while maintaining or improving operational performance. Evaluate pressed and cast metal accelerating explosives. Complete qualification of high performance booster explosive for multiple weapons systems. Begin qualification of best candidate metal accelerating explosive.
Accomplishments: Demonstrated high explosives that show improved IM characteristics while maintaining or improving operational performance. Evaluation of pressed metal accelerating explosives.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.501	0.497	0.273
RDT&E Articles Quantity	0	0	0

Evaluate and Demonstrate IM gun propulsion systems which provide improved or comparable performance to in-service systems and have improved IM characteristics.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.607	0.605	1.041
RDT&E Articles Quantity	0	0	0

Evaluate and demonstrate IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combine candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements. Demonstrate an insensitive multi-mission, high performance rocket motor. Evaluate options for minimum smoke propellants for shoulder launched applications.

Accomplishments: Evaluated and demonstrated IM propellants and propulsion systems which provide improved or comparable performance to in-service systems and better IM characteristics. Combined candidate IM propellants and case concepts to demonstrate compliance with IM and performance requirements.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.291	0.250	0.660
RDT&E Articles Quantity	0	0	0

Evaluate ordnance and container concepts. Model applications that reduce and enhance IM warhead design.
Assess the operation utility of current and projected IM improvements to determine current state of IM and prioritize future funding for IM technology.
Accomplishments: Assessed operational utility of IM improvements and demonstrated feasibility of IM optimization of weapons storage.

C. OTHER PROGRAM FUNDING SUMMARY:
NOT APPLICABLE

D. ACQUISITION STRATEGY:
NOT APPLICABLE-

The Insensitive Munitions Advanced Development Program (IMAD) is assigned as a Non-ACAT program and therefore does not have program milestones like the ACAT I to IV programs.
IMAD develops and evaluates IM technologies for use in Navy weapon systems and is not part of a particular weapon acquisition program.

E. MAJOR PERFORMERS:
NAWC WPN DIV/China Lake - Propulsion Development and Evaluation
NOSSA/Indian Head - Program Management
NSWC Dahlgren - Ordnance and container concept development
NSWC, Indian Head - High Explosive Development and Evaluation
-Gun Propulsion Development and Evaluation

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**				PROJECT NUMBER AND NAME **0363/Insensitive Munitions Adv. Development**						
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			Target Value of Contract
PROPULSION DEV. AND EVAL.	WX	NAWC DIV/CHINA LAKE	88.442			0.625	NOV-08	1.150	NOV-09			0.000
EXPLOSIVES DEV. AND EVAL.	WX	NSWC/INDIAN HEAD DIV.	72.422			0.530	NOV-08	0.866	NOV-09			0.000
ORDNANCE DEV. AND EVAL.	WX	NSWC/DAHLGREN	20.477			0.230	NOV-08	0.551	NOV-09			0.000
GUN PROPULSION AND EVAL.	WX	NSWC/INDIAN HEAD DIV.	1.154			0.497	NOV-08	0.273	NOV-09			0.000
Subtotal Product Development			**182.495**			**1.882**		**2.840**				**0.000**
Remarks:												
Subtotal Support Costs			**0.000**			**0.000**		**0.000**				**0.000**
Remarks:												
Subtotal Test and Evaluation			**0.000**			**0.000**		**0.000**				**0.000**
Remarks:												
Program Management Support	WX	NOSSA	4.476			0.600	NOV-08	0.618	NOV-09			0.000
Subtotal Management Services			**4.476**			**0.600**		**0.618**				**0.000**
Remarks:												
Total Cost			**186.971**			**2.482**		**3.458**				**0.000**

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**				PROJECT NUMBER AND NAME **1821/Conventional Fuzed Warfare Package**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	2.573	4.715	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program provides for orderly planning, timely maturation, and effective transition of Navy 6.2 and 6.3A investments in ordnance technology to missile/weapon systems end item System Development and Demonstration (SD&D) phase development. It is the only Navy 6.3B RDT&E program that addresses improvements in warhead and fuze technology. It focuses on increasing effectiveness against current and emerging threats and is responsive to all mission areas -- anti-air, strike, defense suppression, theater defense, and ship defense. On-going projects make advanced fuze and warhead technology available to and reduce the time and risk for specific system development programs by performing three important functions: (1) identify technology advances with the most potential to improve generic warhead and fuze safety, reliability, and effectiveness, e.g. development and incorporation of Software Guidance Integrated Fuzing - S/W GIF: (2) mature the most promising technologies with a goal of achieving Technology Readiness Level 6, or preferably TRL 7, and (3) transition mature technology to specific cruise missile, surface-to-air missile, and land attack weapons system development programs. The program supports the full spectrum of missile advanced development and technology improvements and in future years will continue to provide the vehicle to address emergent requirements by transitioning mature development efforts into weapon systems with minimal technical and financial risk.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**	PROJECT NUMBER AND NAME **1821/Conventional Fuzed Warfare Package**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.573	4.715	0.000
RDT&E Articles Quantity	0	0	0

Advanced Fuze Technology Development:

FY08/FY09 - Implement advanced fuze technologies to System Development and Demonstration. Designed, developed and tested S/W GIF; significant effort toward completing Mk 45 Mod14/SM-6 TDD V&V.

C. OTHER PROGRAM FUNDING SUMMARY:

Not applicable.

D. ACQUISITION STRATEGY:

Raytheon Missile Systems is designing and implementing Fuze enhancements for current missiles like the SM-2 and for future platforms like the SM-6. This evolution in fuzing technology is required to pace current threats to the US Navy.

E. MAJOR PERFORMERS:

Raytheon Company, Tucson, AZ; SM-2 Block IIIB MK 45 MOD 14 TDD development

NSWC Dahlgren, Dahlgren, VA; Advanced Warhead Technology Analysis;

NAWC China Lake

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**				PROJECT NUMBER AND NAME **2299/Non-Nuclear Expendable Ordnance**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.552	0.890	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This budget item addresses improvements to Navy surface launched (2T) Non-Nuclear Expendable Ordnance (NNEO) outside existing operational capabilities. The commodities comprising 2T NNEO are : Major and medium caliber gun ammunition, small arms ammunition, other ship gun ammunition, pyrotechnics, and demolition items. There are no other RDT&E budget items supporting the 2T NNEO program. This project currently supports the close-out of the Guidance Integrated Fuze (GIF) SAASMS receiver Development to TRL 6.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603609N/CONVENTIONAL MUNITIONS**	PROJECT NUMBER AND NAME **2299/Non-Nuclear Expendable Ordnance**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Continued Development of GPS SAASM Receiver to Technology Readiness	1.552	0.890	0.000
RDT&E Articles Quantity	0	0	0

The Guidance Integrated Fuze (GIF) program is the major constituent of the NNEO budget line. Other NNEO programs include theNext Generation Surface Projectile.

1. FY2008 PLANS:

GIF: Continue development GIF design to Technology Readiness Level (TRL) level 6. Component, subsystem and system qualification testing. This includes planned airgun/spin test qualification of a replacement oscillator (Obsolete part) which is critical to the receiver performance. Oversight and evaluation of SAASM GPS receiver.

2. FY2009 PLAN:

GIF: Continue development of miniature Global Position System (GPS) Selective Availability Anti-Spoofing Module (SAASM) Receiver to TRL level 6. Support transition of SASSM receiver to JITRRS Tactical Radio for further development and fielding. This includes qualification of component using airgun equipment.

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

-Continue development of Guidance Integrated Fuze to Technology Readiness Level 6. Continue Development of GPS SAASM Receiver to Technology Readiness Level of 6.

E. MAJOR PERFORMERS:

Guidance integrated Fuzing - Contractor - Mayflower Communications, Boston, Massachusetts

Gov't - Naval Surface Warfare Center, Dahlgren Division, Dahlgren, Virginia

EXHIBIT R-2, RDT&E Budget Item Justification				DATE: **May 2008**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Advanced Component Development**	PROGRAM ELEMENT (PE) NAME AND NO. **0603611M Marine Corps Assault Vehicles**							
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total			
Total PE Cost	**240.532**	**255.264**	**293.466**	**0.000**	**293.466**			
C0020 Advanced Amphibious Assault Vehicle (AAAV)	**240.532**	**255.264**	**293.466**	**0.000**	**293.466**			
Quantity of RDT&E Articles								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This Program Element (PE) includes funds for the Expeditionary Fighting Vehicle (EFV) Program which will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The EFV will provide the principal means of tactical surface mobility for the Marine Air Group Task Force (MAGTF) during both ship-to-objective maneuvers and sustained combat operations ashore. The EFV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The EFV replaces the AAV7A1 Vehicle, which was originally fielded in the early 1970s. The EFV is a self-deploying, high-water speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical (NBC) environments.

B. PROGRAM CHANGE SUMMARY

	FY2008	FY2009	FY2010
Funding:			
FY 2009 President's Budget:	247.207	316.052	236.874
FY 2010 President's Budget:	240.532	255.264	293.466
Total Adjustments:	-6.675	-60.788	56.592
Summary of Adjustments:			
a. Congressional Program Adjustment	0.000	-60.000	0.000
b. SBIR/STTR Transfer:	-1.450	0.000	0.000
c. Program Adjustments	-5.225	0.000	59.616
d. Rate Adjustments	0.000	-0.788	-3.024
Subtotal	-6.675	-60.788	56.592

EXHIBIT R-2a, RDT&E Project Justification								DATE: MAY 2009		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Advanced Component Dev. and Prototypes		PROGRAM ELEMENT AND NAME 0603611M Marine Corps Assault Vehicles				PROJECT NUMBER AND NAME: C0020 Advanced Amphibious Assault Vehicle (AAAV)				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total					
TOTAL Program Element (PE)	240.532	255.264	293.466	0.000	293.466					
0020 EXPEDITIONARY FIGHTING VEHICLE (EFV)	240.532	255.264	293.466	0.000	293.466					
RDT&E Article Quantities	7									

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Expeditionary Fighting Vehicle (EFV) Program will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The EFV will provide the principal means of tactical surface mobility for the Marine Air-Ground Task Force (MAGTF) during both ship-to-objective maneuvers and sustained combat operations ashore. The EFV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The EFV replaces the AAV7A1 Vehicle, which was originally fielded in the early 1970s. The EFV is a self-deploying, high-water speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical (NBC) environments.

The EFV program is a ACAT-1D program managed by the Marine Corps. The EFV is the next generation of Marine Corps Assault Vehicles being developed to satisfy the requirements of the 21st Century Marine War Fighters. Along with the Landing Craft Air Cushion (LCAC) and the MV-22 Osprey, the EFV will provide the Marine Corps with the tactical mobility assets required within the Expeditionary Maneuver Warfare capstone. Acquisition of the EFV is critical to the Marine Corps. The total EFV requirement is for 573 weapon systems.

The program received approval to enter the System Development and Demonstration (SDD) Phase of the acquisition process during the Milestone II Defense Acquisition Board Readiness Meeting held on 26 November 2000. All program exit criteria were successfully met or exceeded. The initial SDD Phase (2001 through 2008) included validation of manufacturing and production processes, fabrication and testing of SDD vehicles, and finalizing and implementing the Life Cycle Management for EFV. A follow-on SDD Phase begining in FY 2008 will include continued design, development, and reliability upgrades; increased RAM testing; modification of exisitng SDD prototypes; and manufacture and testing of up to seven additional SDD prototype vehicles.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY2008	FY2009	FY2010	FY2010 OCO
Accomplishment/Effort Subtotal Cost	189.280	204.456	244.212	0.000
RDT&E Articles Qty	7			

(U) Design development, developmental testing, operational testing, and survivability program.

FY08: Continued engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continued the EFV survivability program. Continued developmental and reliability test support, and design, integration and testing of MS-C OA identified modifications. Continued development of Integrated Electronic Technical Manuals (IETMs). Continued Developmental Testing (DT) and Reliability/Availability/Maintainability (RAM) testing. Continued design and development of follow-on reliability enhancements, subsystem design modifications, and modification of existing vehicles integrating reliability design changes. Procured test spares. Began manufacture of new SDD prototypes.

FY09: Continue engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continue the EFV survivability program. Continue developmental and reliability test support, and design, integration and testing of MS-C OA identified modifications. Continue development of Integrated Electronic Technical Manuals (IETMs). Continue Developmental Testing (DT) and Reliability/Availability/Maintainability (RAM) testing. Continue design and development of follow-on reliability enhancements, subsystem design modifications, and modification of existing vehicles integrating reliability design changes. Procure test spares. Continue design, development and manufacture of new SDD prototypes.

FY10: Continue engineering and logistics efforts to support design development, manufacturing planning, and design enhancements of the EFV(P) and EFV(C) designs. Continue the EFV survivability program. Continue developmental and reliability test support, and design, integration and testing of MS-C OA identified modifications. Continue development of Integrated Electronic Technical Manuals (IETMs). Continue Developmental Testing (DT) and begin Reliability Growth Testing (RGT). Continue design and development of follow-on reliability enhancements, subsystem design modifications, and modification of existing vehicles integrating reliability design changes. Procure test spares. Continue design, development and manufacture of new SDD prototypes, and begin delivery of prototype vehicles.

EXHIBIT R-2a, RDT&E Project Justification			DATE: MAY 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Advanced Component Dev. and Prototypes	PROGRAM ELEMENT AND NAME 0603611M Marine Corps Assault Vehicles	PROJECT NUMBER AND NAME: C0020 Advanced Amphibious Assault Vehicle (AAAV)	

COST ($ in Millions)	FY2008	FY2009	FY2010	FY2010 OCO
Accomplishment/Effort Subtotal Cost	9.839	9.775	9.551	0.000
RDT&E Articles Qty				

(U) Perform developmental testing, operational testing, RAM-D testing, and Reliability Growth Testing.

FY08: Continue to perform developmental/operational testing and RAM-D testing.
FY09: Continue to perform developmental/operational testing and RAM-D testing.
FY10: Continue to perform developmental/operational testing and RAM-D testing. Begin Reliability Growth Testing (RGT).

COST ($ in Millions)	FY2008	FY2009	FY2010	FY2010 OCO
Accomplishment/Effort Subtotal Cost	3.241	5.470	7.733	0.000
RDT&E Articles Qty				

(U) Provide program support for Training Development, Technical Publications and IETMS.

FY08-FY10: Provide program support for training systems development and technical publications and IETMS; development of training systems courseware.

COST ($ in Millions)	FY2008	FY2009	FY2010	FY2010 OCO
Accomplishment/Effort Subtotal Cost	15.002	16.018	11.875	0.000
RDT&E Articles Qty				

FY08 - FY10: Provide contractor technical, engineering and management support for program planning, analysis and execution. Continue to provide software design, development and integration support.

COST ($ in Millions)	FY2008	FY2009	FY2010	FY2010 OCO
Accomplishment/Effort Subtotal Cost	23.170	19.545	20.096	0.000
RDT&E Articles Qty				

FY08-FY10: Provide In-House technical engineering and integrated logistics support for program planning, analysis and execution. Procure ammunition in support of the EFV test program. Perform in-house software design, development, and analysis efforts.

	FY2008	FY2009	FY2010	FY2010 OCO
(U) Total $	240.532	255.264	293.466	0.000

(U) PROJECT CHANGE SUMMARY:	FY 2008	FY 2009	FY 2010
FY 2009 President's Budget:	247.207	316.052	236.874
a. Congressional Program Reduction	0.000	-60.000	0.000
b. Congressional Misc. Adjustments	0.000	-0.693	0.000
c. SBIR/STTR Transfer	-1.450	0.000	0.000
d. Program Adjustments	-5.225	-0.095	59.616
e. Rate/Misc. Adjustments	0.000	0.000	-3.024
f. FY 2010 President's Budget:	240.532	255.264	293.466

EXHIBIT R-2a, RDT&E Project Justification		DATE: MAY 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Advanced Component Dev. and Prototypes	PROGRAM ELEMENT AND NAME 0603611M Marine Corps Assault Vehicles	PROJECT NUMBER AND NAME: C0020 Advanced Amphibious Assault Vehicle (AAAV)

CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) Schedule: A schedule slip as a result of delayed Preliminary Design Review (PDR) to increase vehicle reliability resulted in the delay of program milestones as indicated below. The detailed program schedule is provided in Exhibit R-4.

	FY09 President's Budget	FY10 President's Budget
SDD-2 Contract Award	2Q, FY08	4Q, FY08
CDR	4Q, FY08	1Q, FY09
DT II and RAM-D	thru 4Q, FY09	thru 1Q, FY10

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	Prior Yrs.	FY 2008	FY 2009	FY 2010	FY 2010 OCO
(U) PANMC, BLI #147500, EFV	0.000	0.004	0.000	0.000	0.000
(U) PMC BA2, BLI #202200, EFV Regular Procurement	176.044				
(U) PMC BA2, BLI #202200, EFV Adv Proc Credit	0.000				
(U) PMC BA2, BLI #202200, EFV Adv Proc	9.754				
(U) PMC BA7, BLI #700000, Initial EFV Spares	7.057				
(U) PMC, Total	192.855	0.000	0.000	0.000	0.000

(U) Related RDT&E: None

EXHIBIT R-2a, RDT&E Project Justification		DATE: MAY 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Advanced Component Dev. and Prototypes	PROGRAM ELEMENT AND NAME 0603611M Marine Corps Assault Vehicles	PROJECT NUMBER AND NAME: C0020 Advanced Amphibious Assault Vehicle (AAAV)

(U) D. ACQUISITION STRATEGY:

The EFV Program acquisition strategy includes the extensive use of test assets, models, simulation, and advanced technology research to optimize vehicle design, reduce Total Ownership Cost (TOC), and control vehicle unit cost. Three fully functional PDRR prototypes were developed and have undergone extensive developmental testing to further vehicle maturity. During the initial SDD phase of the program, nine prototype vehicles were manufactured and tested extensively in developmental and operational tests. A tenth vehicle was manufactured for use during Full Up System Level Lethality testing. A follow-on SDD phase contract was awarded in Jul 08 to incorporate major reliability modifications into existing prototypes, and manufacture and test seven new SDD prototypes.

The EFV management strategy is event driven, designed to ensure a logical progression through the EFV acquisition to reduce risk, ensure affordability, and provide adequate information to decision makers regarding acquisition progress. The EFV Program team is a partnership of government and industry experts, committed to developing the most versatile combat vehicle, providing the optimum balance of combat effectiveness, affordability, innovation, and technology. The program Integrated Product Teams (IPTs), composed of contractors, sub-contractors, Marines, and government civilians, are the foundation of the EFV acquisition management process. The government, prime contractor, and major subcontractors are co-located in a highly integrated communication environment that facilitates proactive decision-making processes and flexible execution of plans to support these teams and product development.

Cost as an independent variable (CAIV) has been institutionalized throughout the program and as such is an integral consideration in all trade studies and decisions. The program has had a highly integrated and extensive test approach since its inception which has included a very strong engineering-model and prototype testing program supported by extensive modeling and simulation techniques which is intended to continue throughout SDD. As a Program Management Oversight for Life Cycle Support pilot program, the program office management strategy includes planning for life cycle support once the system is fielded to more efficiently manage and optimize operating and support requirements and reduce overall program cost.

The program's contracting approach for the EFV is to award the vast majority of the work to one prime contractor, competitively selected in 1996. GDLS operating through its division General Dynamics Amphibious System will be responsible for designing and producing the vehicle and providing support for testing from PDRR through LRIP. Contracts for Government Furnished Property will be kept to a minimum and will include only property which could not otherwise be available to the contractor. Local Area Network support contract is currently provided by an 8(a) firm. Contract support for programmatic and technical support was competitively awarded in December 2008 as a firm fixed price contract and will continue through FY10.

(U) E. MAJOR PERFORMERS:

General Dynamics, Woodbridge, VA. Validation of manufacturing and production processes, fabrication and testing of SDD vehicles, and finalizing and implementing Life Cycle Management. Initial SDD contract awarded Feb 01.

Exhibit R-3 Cost Analysis						DATE: MAY 2009								
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME								
RDT&E, N /BA-4 Advanced Component Development and Prototypes		0603611M Marine Corps Assault Vehicles				C0020 Advanced Amphibious Assault Vehicle (AAAV)								
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total PY s Cost**	**FY 08 Cost**	**FY 08 Award Date**	**FY 09 Cost**	**FY 09 Award Date**	**FY10 Cost**	**FY 10 Award Date**					
Product Development														
PDRR Contract	CPAF	GDLS - Woodbridge, VA	399.703	0.000		0.000		0.000						
System Design and Development	CPAF	GDLS - Woodbridge, VA	1,268.379	145.495	1Q-2Q	66.000	1Q-2Q	0.000						
System Design and Development	CPAF	GDLS - Woodbridge, VA	11.618	42.330	4Q	136.189	1Q-2Q	226.918	1Q-2Q					
Other Product Development	TBD	TBD	0.000	0.000	N/A	1.432	3Q	16.094	2Q					
Follow-On Product Development	TBD	TBD	0.000	0.000	N/A	0.000	N/A	0.000	N/A					
Regenerative Filtration	CPAF	Army, Edgewod Chem/Bio Ctr	3.327	0.000		0.000		0.000						
Survivability Contract	Classified	NSMA, Arlington, VA	26.028	1.455	2Q	0.834	2Q	1.200	2Q					
Display Technology	CPFF	ISR Corp	1.640	0.000		0.000		0.000						
Intelligent Machining of Advanced Defense Materials	CP	GDLS - Woodbridge, VA	2.914	0.000		0.000		0.000						
Digital Facsimile Upgrade	TBD	TBD	2.816	0.000		0.000		0.000						
Sub Total Product Development			**1,716.425**	**189.280**		**204.456**		**244.212**						
Remarks:														
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total PY s Cost**	**FY 08 Cost**	**FY 08 Award Date**	**FY 09 Cost**	**FY 09 Award Date**	**FY10 Cost**	**FY 10 Award Date**					
Program Support														
Integrated Logistics Support	Various	Various	10.617	6.702	2Q	3.655	2Q	4.014	2Q					
Training Devices/Simulators	CPAF	GDLS	49.397	2.495	2Q	5.160	3Q	7.383	2Q					
Tech Data & Pubs Development	Various	Various	0.690	0.315	2Q	0.310	2Q	0.350	2Q					
Support Equipment Development	Various	Various	0.000	0.431	2Q	0.000	2Q	0.000	2Q					
Subtotal Program Support			**60.704**	**9.943**		**9.125**		**11.747**						
Remarks:														
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total PY s Cost**	**FY 08 Cost**	**FY 08 Award Date**	**FY 09 Cost**	**FY 09 Award Date**	**FY10 Cost**	**FY 10 Award Date**					
Test & Evaluation														
Developmental, Operational and Live Fire Test & Evaluation	Various	Various	85.771	9.839	1Q-2Q	9.776	1Q-2Q	9.551	1Q-2Q					
Sub Total Test & Evaluation			**85.771**	**9.839**		**9.776**		**9.551**						
Remarks:														
Cost Categories	**Contract Method & Type**	**Performing Activity & Location**	**Total PY s Cost**	**FY 08 Cost**	**FY 08 Award Date**	**FY 09 Cost**	**FY 09 Award Date**	**FY10 Cost**	**FY 10 Award Date**					
Contract Advisory & Asst Svc (A&AS)														
Engineering and Technical Services	RCP / MIPR	Various	25.456	6.735	2Q	8.851	2Q	5.352	2Q					
Management Support Services	RCP / MIPR	Various	44.433	8.168	1Q	6.648	1Q	6.057	1Q					
Studies and Analyses	RCP / MIPR	Various	0.000	0.098	2Q	0.519	2Q	0.465	2Q					
Sub Total A&AS			**69.890**	**15.002**		**16.018**		**11.875**						
Remarks:														
Management Support														
In-House Technical Support	Various	Various	105.958	15.150	1Q-3Q	14.359	1Q-3Q	14.441	1Q-3Q					
Program Management Support	Various	Various	22.869	0.201	2Q	0.331	2Q	0.306	2Q					
Travel		Various	3.497	1.118	1-4Q	1.200	1-4Q	1.335	1-4Q					
Sub Total Management Support			**132.324**	**16.468**		**15.891**		**16.081**						
Remarks:														
Total Cost			**2,065.114**	**240.532**		**255.264**		**293.466**						

EFV (AAAV) PROGRAM SCHEDULE

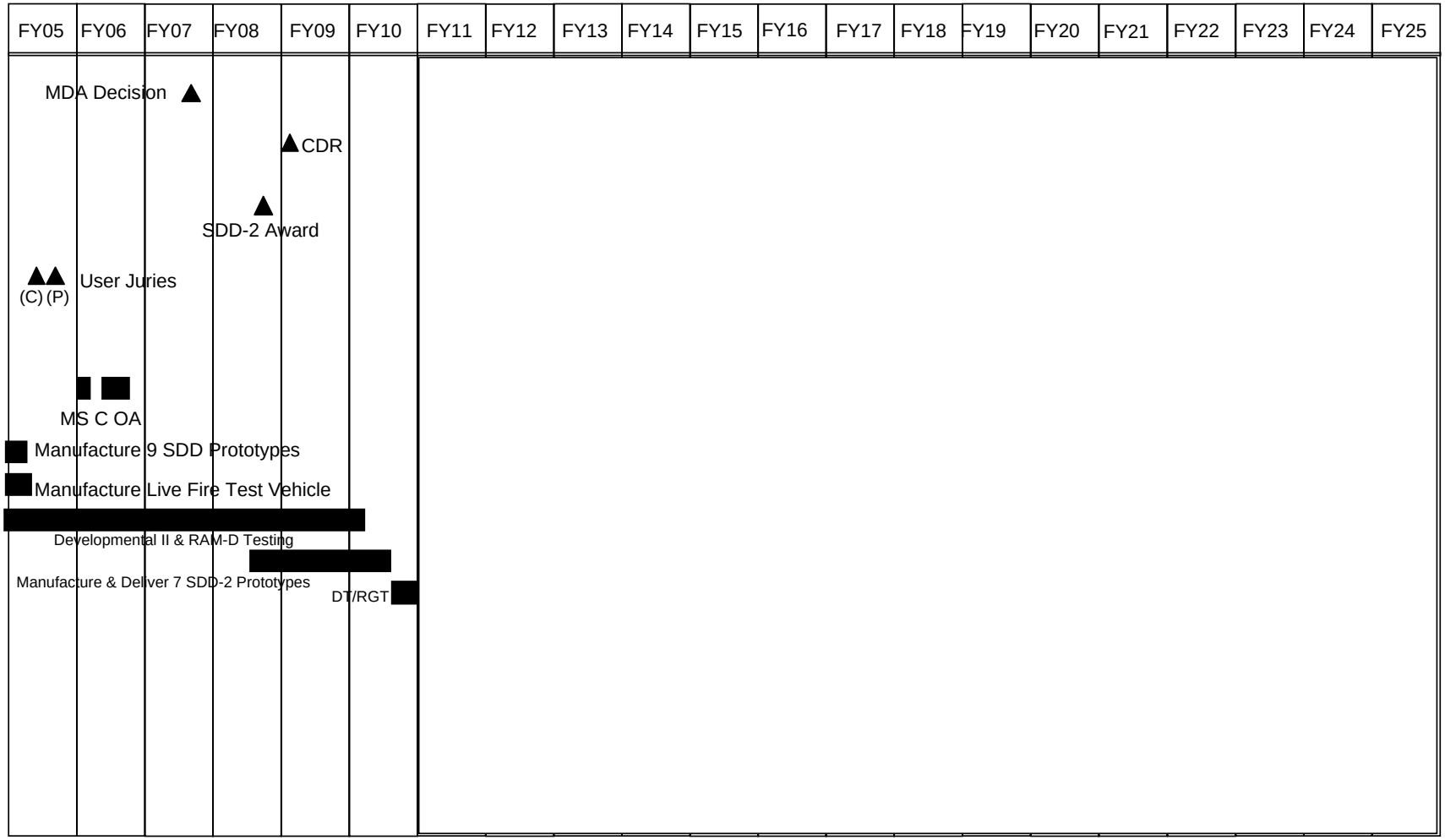


Exhibit R-4/4a Schedule Profile/Detail							DATE: MAY 2009			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Advanced Component Development and Pro	PROGRAM ELEMENT NUMBER AND NAME 0603611M Marine Corps Assault Vehicles					PROJECT NUMBER AND NAME C0020 Advanced Amphibious Assault Vehicle (AAAV)				
	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
SCHEDULE DETAIL										
MS C										
FRP Decision										
IOC										
Operational Assessments										
Developmental II & RAM-D Testing	1-4Q	1-4Q	1Q							
CDR		1Q								
SDD-2 Contract Award	4Q									
LRIP Contract Award										
LRIP Deliveries Lot 1										
LRIP Deliveries Lot 2										
IOT&E										
Full Up System Level Live Fire Test										
Ready for Training										
Full Rate Contract Award										

EXHIBIT R-2, RDT&E Budget Item Justification				DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**	PROGRAM ELEMENT (PE) NAME AND NO. **0603612M USMC Mine Countermeasures Systems-Adv Dev**							
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total			
Total PE Cost	**0.801**	**0.000**	**0.000**	**0.000**	**0.000**			
C2106 Advanced Mine Detector	**0.801**	**0.000**	**0.000**	**0.000**	**0.000**			
Quantity of RDT&E Articles								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This Program Element (PE) includes funds for Marine Corps advanced development of mine/countermine programs to include items for mine detection, mine clearing, lane proofing and lane marking.

B. PROGRAM CHANGE SUMMARY

	FY2008	FY2009	FY2010
Funding:			
FY 2009 President's Budget:	0.648		
FY 2010 President's Budget:	0.801		
Total Adjustments:	0.153		
Summary of Adjustments:			
a. SBIR/STTR Transfer:	-0.002		
b. Program Adjustments	0.155		
Subtotal	0.153		

EXHIBIT R-2, RDT&E Budget Item Justification				DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**	PROGRAM ELEMENT (PE) NAME AND NO. **0603635M Marine Corps Ground Combat/Support Systems**							
	FY 08	**FY 09**	**FY 10**	**FY 10 OCO**	**FY 10 Total**			
Total PE	**54.405**	**65.253**	**73.798**	**0.000**	**73.798**			
C1964 Joint Anti-Armor Weapon System (Javelin)	**3.856**	**1.596**	**1.443**	**0.000**	**1.443**			
C2614 SMAW Follow-On	**3.061**	**15.007**	**14.391**	**0.000**	**14.391**			
C3209 Joint Light Tactical Vehicle	**39.969**	**43.867**	**57.964**	**0.000**	**57.964**			
C9999 Congressional Adds	**7.519**	**4.783**	**0.000**	**0.000**	**0.000**			
Quantity of RDT&E Articles								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This PE supports the demonstration and validation of Marine Corps Ground/Supporting Arms Systems for utilization in Marine Air-Ground Expeditionary Force amphibious operations.

This program is funded under DEMONSTRATION & VALIDATION because it develops and integrates hardware for experimental test related to specific ground weapon system.

B. PROGRAM CHANGE SUMMARY

	FY2008	FY2009	FY2010
Funding:			
FY 2009 President's Budget:	56.725	59.049	68.407
FY 2010 President's Budget:	54.405	65.253	73.798
Total Adjustments:	-2.320	6.204	5.391
Summary of Adjustments:			
a. SBIR/STTR Transfer:	-0.306		
b. Program Adjustments:	-2.014	-0.177	6.539
c. Rate/Misc Adjustments:			-0.088
d. Congressional Adjustments:		6.381	-1.060
Subtotal	-2.320	6.204	5.391

EXHIBIT R-2a, RDT&E Project Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME			
RDT&E, N /BA-4 Demonstration/Validation	**0603635M Marine Corps Ground Combat/Support Systems**				**C1964 Joint Anti-Armor Systems**			
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
Project Cost	3.856	1.596	1.443	0.000	1.443			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The AAWS-H program, working in concert with the US Army, will develop and integrate technology improvements into the Improved Target Acquisition System (ITAS) to meet Increment II system requirements as jointly agreed. Improvements will center on integration of a battlefield networking communications capability and a laser designation capability.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.000	0.000	0.814	0.000
RDT&E Articles Qty				

Anti Armor (C1964) - Contractor conducted systems integration and qualification

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.000	0.000	0.303	0.000
RDT&E Articles Qty				

Anti Armor (C1964) - Provide engineer and technical support.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.000	0.000	0.325	0.000
RDT&E Articles Qty				

Anti Armor (C1964) - Provide government program management / in-house support.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	3.856	1.596	0.000	0.000
RDT&E Articles Qty				

Congressional/Urban Operations Environmental Lab (C1964A) - Conduct analyses, develop newly emerging non-lethal technologies, and explore novel technological solutions, in support of the development and utilization of non-lethal and nontraditional technologies for military operations particularly in urban and littoral environments by small, highly mobile units.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.000	0.000	0.001	0.000
RDT&E Articles Qty				

MERS (C1964) - Conduct analysis of Soldier and Marine Infantry Systems and highlight integration issues; plan for modernization of future systems; develop processes and procedures for configuration management of the Infantry Squad.

(U) Total $	**3.856**	**1.596**	**1.443**	**0.000**

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2010 0C0**	**FY 2010 Total**
PMC BLI 301700 Anti Armor System Heavy	0.000	0.000	71.225	0.000	71.225

(U) Related RDT&E: Not Applicable.

(U) D. ACQUISITION STRATEGY: FY10 is to conduct the development, integration and qualification of the battlefield networking capability into the ITAS.

(U) E. MAJOR PERFORMERS:

Raytheon, McKinney, TX (Systems Integration and Qualification)
NSWC Dahlgren, VA (Engineering and Technical Support)
Contractor TBD (PMO Support)

Exhibit R-3 Cost Analysis								DATE: **May 2009**							
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**		PROGRAM ELEMENT **0603635M Marine Corps Ground Combat/Support Arms Systems**						PROJECT NUMBER AND NAME **C1964 Joint Anti-Armor Systems**							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Anti Armor	WR	NSWC, Dahlgren, VA	0.000	0.000		0.000		0.303	10/09						
Subtotal Support			**0.000**	**0.000**		**0.000**		**0.303**							
Remarks:															
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
MERS/UOEL	FFP	MERS VARIOUS	0.000	3.856	VAR	1.596	VAR	0.001	10/09						
Anti Armor	C/CPIF	Raytheon, McKinney, TX	0.000	0.000		0.000		0.814	03/10						
Subtotal T&E			**0.000**	**3.856**		**1.596**		**0.815**							
Remarks:															
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Anti Armor	FFP	MCSC, Quantico, VA	0.000	0.000		0.000		0.325	10/09						
Subtotal Management			**0.000**	**0.000**		**0.000**		**0.325**							
Remarks:															
Total Cost			**0.000**	**3.856**		**1.596**		**1.443**							

EXHIBIT R-2a, RDT&E Project Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**	PROGRAM ELEMENT NUMBER AND NAME **0603635M Marine Corps Ground Combat/Support Systems**				PROJECT NUMBER AND NAME **C9999 CONGRESSIONAL ADDS**			
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
Project Cost	**7.519**	**3.586**	**0.000**	**0.000**	**0.000**			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**4.820**	**1.990**	**0.000**	
RDT&E Articles Qty				

Anti-Sniper Infrared Target System (ASITS) C9873A -FY08: Development, exploitation and enhancement of capabilities of Anti-Sniper Infrared Targeting System (ASITS).

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.000**	**1.596**	**0.000**	
RDT&E Articles Qty				

Marine Sensor Integrated, Modular Protection C9A07A - The goal of the MSIMP program is to effectively integrate the various sensors and display systems required by the Marine by developing concepts for integrating enhanced protection, sensing, information display, and communications technologies into a single, self-contained unit to be mounted on the USMC's in-service LWH.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**2.699**	**0.000**	**0.000**	
RDT&E Articles Qty				

Intelligent Machining of Advanced Defense Materials C9B89A - Provides for the software/hardware development and integration of advanced machining processes applicable to various defense weapons platforms.

(U) Total $	**7.519**	**3.586**	**0.000**	

(U) C. OTHER PROGRAM FUNDING SUMMARY:
(U) Related RDT&E: Not Applicable.
(U) D. ACQUISITION STRATEGY:
(U) E. MAJOR PERFORMERS:

EXHIBIT R-2a, RDT&E Project Justification					DATE: MAY 2009					
APPROPRIATION/BUDGET ACTIVITY RDT&E, N /BA-4 Adv Component Dev. and Prototypes	PROGRAM ELEMENT NUMBER AND NAME 0603635M MC Ground Combat / Supporting Arms Systems				PROJECT NUMBER AND NAME C9B89A Congressional - Intelligent Machining of Adv Defense Materials					
	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total					
Project Cost	2.699	0.000	0.000	0.000	0.000					
RDT&E Articles Qty										

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
(U) 9B89 Congressional Add for Intelligent Machining of Advanced Defense Materials

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	2.699	0.000	0.000	0.000
RDT&E Articles Qty				

Research and develop intelligent machining, the standardization of machining software, process management, and optimization of machining operations for a variety of high performance materials using new and existing manufacturing assests and processes at the Joint Systems Manufacturing Center (JSMC) in Lima, Ohio.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
(U) Total $	2.699	0.000	0.000	0.000

(U) D. ACQUISITION STRATEGY:

A sole source contract was awarded on 31 Jul 08.

(U) E. MAJOR PERFORMERS:

General Dynamics Land Systems (GDLS) is the sole contractor responsible for manufacturing and facility operation at the Joint Systems Manufacturing Center (JSMC) in Lima, Ohio.

(U) SCHEDULE PROFILE:

EXHIBIT R-2a, RDT&E Project Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME			
RDT&E, N /BA-4 Demonstration/Validation	0603635M Marine Corps Ground Combat/Support Systems				C2614 FOLLOW ON TO SMAW (FOTS)			
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
Project Cost	3.061	15.007	14.391	0.000	14.391			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Marine Expeditionary Forces will employ the Shoulder-launched Multipurpose Assault Weapon II (SMAW II) across the spectrum of conflict, under all environmental conditions, to destroy a variety of ground targets. This requirement relates to The Concept for Future Military Operations on Urbanized Terrain, dated 25 July 1997, which requires Marine units to possess the capability to rapidly breach urban structures in order to facilitate and enhance their mobility in an urban environment. The SMAW II will support the Joint Operating Concept, Major Combat Operations via the Force Application Joint Functional Concept.

The mission of the SMAW II is to provide short-range assault fires in support of infantry forces attacking fortified positions and urban structures under all field and environmental conditions. This includes employment under Mission Oriented Protective Posture (MOPP) IV Level CBRN conditions. A typical operating environment for the SMAW II will consist of a mission duration of 96 hours. During this mission the system will be transported 40 km (25 miles) in the field handling mode, using various tactical means, 50% cross country. The system will be The solution to the FOTS requirement is the SMAW II system, which will be developed in two distinct blocks. Block 1 of the SMAW II system consists of new SMAW launcher, which will be physically and functionally compatible with all current SMAW ammunition variants, and a Multipurpose (MP) Fire-From-Enclosure (FFE) SMAW round. Block 2 of the SMAW II system will be the addition of a Wall Breaching (WB) FFE round and a Common Practice (CP) FFE round. During FY08-10, the development and qualification of Block 1 will be completed.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	2.139	11.785	10.344	0.000
RDT&E Articles Qty				
Contractor conducted systems integration and qualification				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.610	1.928	1.774	0.000
RDT&E Articles Qty				
Provide engineer and technical support.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.222	0.908	0.926	0.000
RDT&E Articles Qty				
Provide government program management / in-house support.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	0.090	0.386	1.347	0.000
RDT&E Articles Qty				
Provide operational test support planning and document preparation.				
(U) Total $	3.061	15.007	14.391	0.000

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
PMC BLI 301600 Follow on to SMAW	0.000	0.000	25.333

(U) Related RDT&E: Not Applicable.

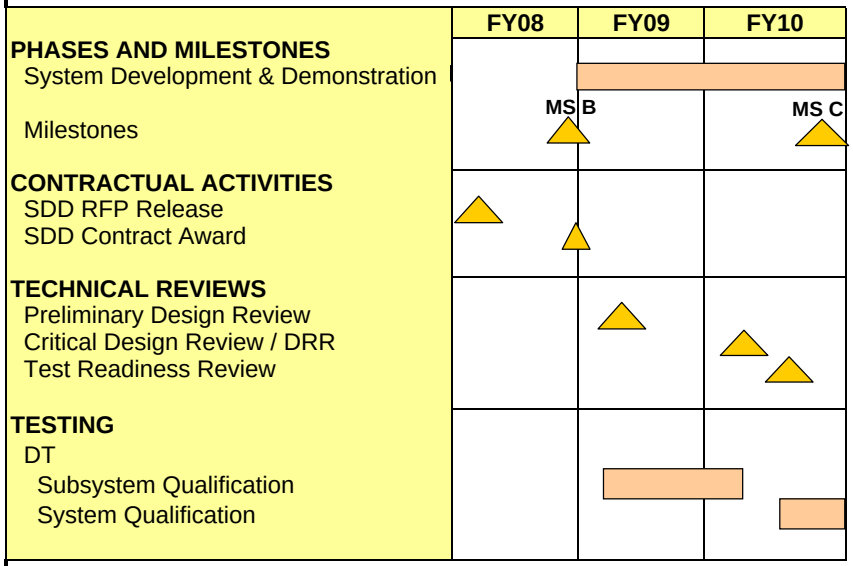
(U) D. ACQUISITION STRATEGY: FY08-10 strategy is to conduct full and open competition to select contractor to complete development and qualification of the Block 1 SMAW II system (i.e. new SMAW Launcher and new Multi Purpose Fire From Enclosure (MP FFE) round).

(U) E. MAJOR PERFORMERS:

NAMMO Talley, Mesa, AZ (System Development & Demonstration)
NSWC, Dahlgren Division, VA (Engineering & Technical Support)
BAE Systems, Stafford VA (Program Management Support)
MCOTEA, Quantico, VA (Operational Test & Evaluation)

Exhibit R-3 Cost Analysis								DATE: May 2009						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**		PROGRAM ELEMENT **0603635M Marine Corps Ground Combat/Support Arms Systems**						PROJECT NUMBER AND NAME **C2614 FOLLOW ON TO SMAW (FOTS)**						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Systems Integration	C/CPFF	NAMMO Talley, Mesa, AZ	0.000	2.139	08/08	11.785	10/08	10.344	10/09					
Subtotal Product Dev			**0.000**	**2.139**		**11.785**		**10.344**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Engineering and Technical Spt	WR	NSWC, Dahlgren, VA	0.800	**0.610**	10/07	**1.928**	10/08	**1.774**	10/09					
Subtotal Support			**0.800**	**0.610**		**1.928**		**1.774**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Program Mgmt and Eng Support	WR	MCOTEA, Quantico, VA	0.208	0.222	10/07	0.908	10/08	0.926	10/09					
Subtotal T&E			**0.208**	**0.222**		**0.908**		**0.926**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Operational Testing and Support	FFP	BAE Systems, Stafford, VA	0.078	0.090	10/07	0.386	10/08	1.347	10/09					
Subtotal Management			**0.078**	**0.090**		**0.386**		**1.347**						
Remarks:														
Total Cost			**1.086**	**3.061**		**15.007**		**14.391**						

Exhibit R-4-4a Project Schedule/Detail		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**	PROGRAM ELEMENT **0603635M Marine Corps Ground Combat/Support Arms Systems**	PROJECT NUMBER AND NAME **C2614 FOLLOW ON TO SMAW (FOTS) BLOCK 1**



Program Funding Summary (APPN, BLI #, NOMEN)	**FY 2008**	**FY 2009**	**FY 2010**
(U) RDT&E,N, C2614, Follow-on to SMAW	3.061	15.007	14.391
(U) PMC, BLI 301600, Follow-on to SMAW	0.000	0.000	25.333

Exhibit R-4-4a Project Schedule/Detail		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration/Validation**	PROGRAM ELEMENT **0603635M Marine Corps Ground Combat/Support Arms Systems**	PROJECT NUMBER AND NAME **C2614 FOLLOW ON TO SMAW (FOTS) BLOCK 1**

	FY 2008	FY2009	FY2010						
Milestone B	4th Qtr								
Milestone C			4th Qtr						

EXHIBIT R-2a, RDT&E Project Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-04 Demonstration and Validation**	PROGRAM ELEMENT NUMBER AND NAME **0603635M Marine Corps Ground Combat/Support Systems**				PROJECT NUMBER AND NAME **C3209 Joint Light Tactical Vehicle**			
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY 2010 OCO	FY 2010 Total			
Project Cost	**39.969**	**43.867**	**57.964**	**0.000**	**57.964**			
RDT&E Articles Qty	**10**							

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Joint Light Tactical Vehicle (JLTV) Family of Vehicles (FOV): FY08 and future funding supports the development and testing of the JLTV, which is being developed as a joint system between the Army and Marine Corps. The JLTV goal is a family of vehicles with companion trailers capable of performing multiple mission roles that will be designed to provide protected, sustained, networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased protection and performance over the current fleet; minimizing ownership costs by maximizing commonality, fuel efficiency and other means; and maintaining effective competition throughout the lifecycle. The JLTV FoV includes ten (10) sub-configurations (and companion trailers) in three payload categories. Commonality of components, maintenance procedures, training, etc., between vehicles and trailers is expected to be inherent in FoV solutions within and across Payload Categories to minimize FoV total ownership cost. Unique service requirements have been minimized.

During FY 10, major budget activities will support completion of ballistic hull testing, vehicle performance testing, user evaluations, reliability testing and prototype livefire evaluations. The Defense Acquisition Executive's mandate is that the JLTV FoV undergo a robust Technology Development Phase, with multiple competitive prototypes in order to assure requirements achievability, verified by demonstration of those systems.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**20.928**	**0.000**	**0.000**	**0.000**
RDT&E Articles Qty*	10			
Prototype Articles				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**12.703**	**35.515**	**27.752**	**0.000**
Primary and Ancillary Hardware Development and Systems Engineering				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**0.073**	**0.112**	**0.000**	**0.000**
GFE and Tooling to Support Product Development and Testing				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**0.526**	**2.061**	**10.686**	**0.000**
Support Test and Evaluation Program with Army				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**0.000**	**0.615**	**13.314**	**0.000**
ILS and Facilities Documentation/Analyses and Develop Support Equipment				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2010 OCO
Accomplishment/Effort Subtotal Cost	**5.739**	**5.564**	**6.212**	**0.000**
Program Management at Quantico and Contractor Support				
(U) Total $	**39.969**	**43.867**	**57.964**	**0.000**

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-04 Demonstration and Validation**	PROGRAM ELEMENT NUMBER AND NAME **0603635M Marine Corps Ground Combat/Support Systems**	PROJECT NUMBER AND NAME **C3209 Joint Light Tactical Vehicle**

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010	FY 2010 OCO	FY 2010 Total
US Army JLTV-AD R&D 0603804A - L04	106.434	21.985	32.658		

(U) Related RDT&E:

(U) D. ACQUISITION STRATEGY:

The JLTV Acquisition Strategy for the Technology Demonstration (TD) phase was to competitively award multiple contracts. The Government awarded three contracts on 29 Oct 2009. During this phase, the contractors will be required to design the JLTV Family of Vehicles (FoV) to the Preliminary Design Review level and fabricate and test selected prototypes and trailers for payload Categories A, B, and C. The fabricated prototypes will undergo developmental testing, as well as, limited user assessments, in a relevant environment at test facilities. The goal is to ensure the family of prototypes is mature in terms of supporting technologies and full system integration for MS B approval and entry into the Engineering Manufacturing Development phase.

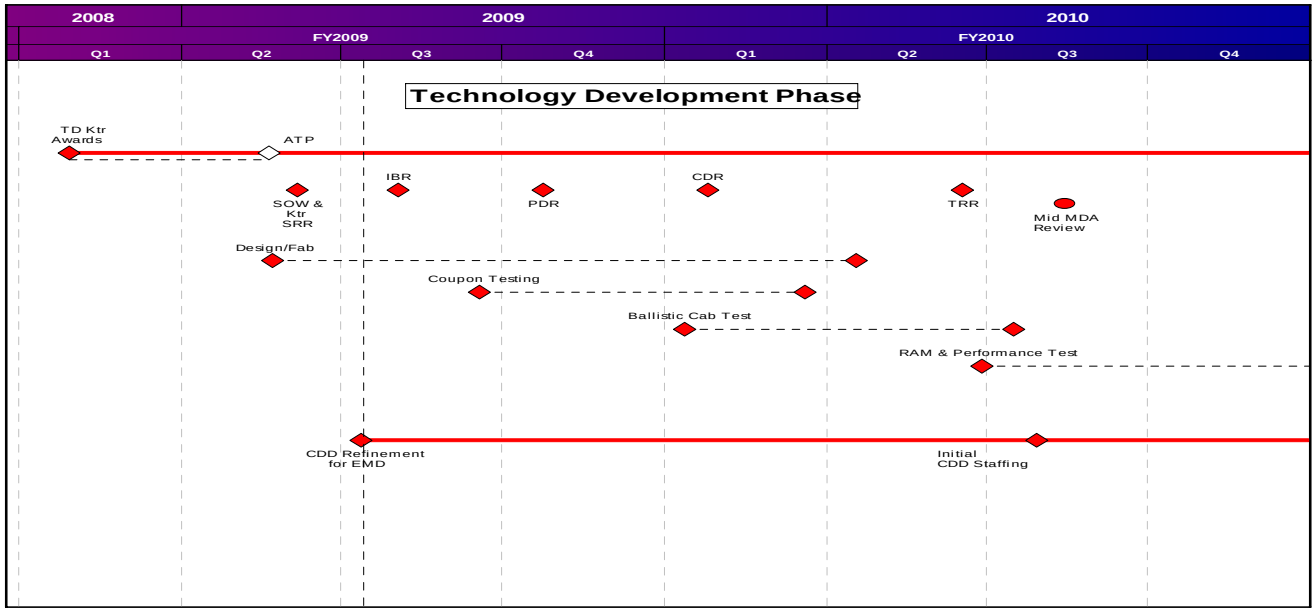
(U) E. MAJOR PERFORMERS:

BAE Systems Land & Armament Systems, General Tactical Vehicles (A Joint Venture of General Dynamics Land Systems, Inc. and AM General, LLC), and Lockheed Martin Systems Integration

Notes: *Vehicle prototypes represent the USMC contribution to the Joint Program.

Exhibit R-3 Cost Analysis										DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-04 Demonstration and Validation**			PROGRAM ELEMENT **0603635M Marine Corps Ground Combat/Support Systems**					PROJECT NUMBER AND NAME **C3209 Joint Light Tactical Vehicle**							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Primary Hardware Development - TD	C/Cshare	BAE Systems, Santa Clara, CA	0.000	10.499	10/08	14.672	3/09	6.243	11/09						
Primary Hardware Development - TD	C/Cshare	General Tactical Vehicles, Sterling, MI	0.000	10.499	10/08	8.418	3/09	7.882	11/09						
Primary Hardware Development - TD	CPFF	Lockheed Martin, Owego, NY	0.000	10.499	10/08	10.314	3/09	5.463	11/09						
Primary Hardware Development - EMD	TBD	TBD	0.000	0.000	N/A	0.000	N/A	0.000	N/A						
Ancillary Hardware Development	N/A	N/A	0.000	0.000	N/A	0.000	N/A	0.000	N/A						
Systems Engineering	Various	Various	0.362	2.059	Various	2.111	Various	8.164	Various						
Tooling	N/A	N/A	0.000	0.000	N/A	0.000	N/A	0.000	N/A						
GFE	MIPR	Various	0.000	0.073	Various	0.112	N/A	0.000	N/A						
JLTV CTV Variant Demonstrator Design and Evaluation	CPFF	NATC Carson City, Nevada	1.569	0.075	7/08	0.000	N/A	0.000	N/A						
Subtotal Product Dev			**1.931**	**33.704**		**35.627**		**27.752**							
Remarks: TD phase contract execution continues in FY10, including vendor support of test and evaluation events. Government funded systems engineering activities increase, as the program conducts modeling and simulation activities utilizing TD phase data.															
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Training Development	Various	Various	0.000	0.000		0.027	Various	0.785	Various						
Integrated Logistics Support	Various	Various	0.293	0.000		0.588	Various	12.529	Various						
Subtotal Support			**0.293**	**0.000**		**0.615**		**13.314**							
Remarks: Significant ILS activities commence in FY10, such as facility assessments, which are required to support JLTV and include studies to define types of facilities or facility improvements, location, space needs, environmental requirements, and equipment associated with JLTV.															
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Developmental Test & Evaluation	MIPR	Aberdeen Proving Ground, Md; Yuma Proving Ground, Az	0.000	0.000	N/A	1.554	5/09	9.798	11/09						
Developmental Test & Evaluation	Various	Various	0.000	0.526	Various	0.507	Various	0.888	11/09						
Subtotal T&E			**0.000**	**0.526**		**2.061**		**10.686**							
Remarks: Primary, Government led TD phase developmental test activities, such as RAM (Reliability, Availability, & Maintainability) testing commence in FY10.															
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date						
Program Management Support	FFP	SAIC	0.000	2.179	12/07	2.130	12/08	2.183	12/09						
Program Management Support	Various	Various	2.618	3.395	Various	3.259	Various	3.850	Various						
Program Management Personnel															
Travel	N/A	MCSC, Quantico, Va	0.008	0.165	10/07	0.175	10/08	0.179	10/09						
Subtotal Management			**2.626**	**5.739**		**5.564**		**6.212**							
Remarks:															
Total Cost			**4.850**	**39.969**		**43.867**		**57.964**							
Remarks:															

Exhibit R-4-4a Project Schedule/Detail		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N /BA-04 Demonstration and Validation	**0603635M Marine Corps Ground Combat/Support Systems**	**C3209 Joint Light Tactical Vehicle**



Program Funding Summary (APPN, BLI #, NOMEN)	**FY 2008**	**FY 2009**	**FY 2010**
(U) RDT&E,N PU C3209	39.969	43.867	57.964

		FY 2008	FY 2009	FY 2010
MS A		1Q		
TD Phase Developmental Testing			3Q→	
Integrated Baseline Reviews			3Q	
Preliminary Design Reviews			4Q	
Critical Design Reviews				1Q
Milestone Decision Authority Review				3Q

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	80.949	114.127	21.054				
0377 / JT Service Expl Ord Disp System	14.507	11.625	12.546				
1317 / EOD Diving System	2.699	2.746	3.535				
3177 / Joint Counter Radio-Controlled IED Elec Warfare*	59.631	96.170	0.000				
4023 / VSM MCM/Force Protection UUV	4.112	3.586	4.973				

A. MISSION DESCRIPTION:

This is a Joint Service Program. This program provides for the development of Explosive Ordnance Disposal tools and equipment for use by all military services. The responsibility is assigned to the Navy as single service manager, by Department of Defense Directive 5160.62 of 26 April 1989, for management of the Joint Service Explosive Ordnance Disposal Research and Development Program. Proliferation of sophisticated types of foreign and domestic ordnance and Improvised Explosive Devices necessitate a continuing development program to provide Explosive Ordnance Disposal personnel of all military services with the special equipment and tools required to support this mission. This program also provides life support related equipment necessary to support the performance of Navy Explosive Ordnance Disposal tasks underwater. This equipment must have inherently low acoustic and magnetic signatures in order to allow the Explosive Ordnance Disposal technician to safely approach, render-safe and dispose of sea mines and other underwater ordnance. This program also provides force protection of all military services against Radio Controlled Improvised Explosive Devices (RCIED) to prevent initiation. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Electronic Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007,requiring RDT&E to develop capabilities that meet joint requirements.

*Beginning in FY10 the Joint Counter Radio Controlled IED Electronic Warfare program will move to RDTEN PE 0604653N.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	81.608	115.086	91.026
FY10 President's Budget	80.949	114.127	21.054
Total Adjustments	-0.659	-0.959	-69.972
(U) Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		-0.312	
SBIR/STTR/FTT Assessment	-0.659		
Program Adjustments		-0.573	-69.786
Rate/Misc Adjustments		-0.074	-0.186
Total	-0.659	-0.959	-69.972

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMEN**				PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	14.507	11.625	12.546				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provides Explosive Ordnance Disposal personnel of all military services with the specialized equipment and tools required to support their mission of detection/location, identification, render-safe, recovery, field and laboratory evaluation, and disposal of unexploded ordnance (UXO) that is a threat to military operations, installations, personnel, or material. UXO includes foreign and domestic, both conventional and non-conventional, including Improvised Explosive Devices (IEDs).

* Advanced EOD Robot System consists of multiple interoperable robot systems. The first class of robot and the architecture for the system will be developed first, then the other classes of robots will be developed.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	7.712	7.181	6.933
RDT&E Articles Quantity	0	0	0

FY08 Initiated the EOD Future Radiographic System formal acquisition project.
FY09 Conducted Full Rate Production Decision Review for JEOD DSS, initiating production.
FY10 Conduct Production decision for EOD Future Radiographic System (FRS) and initiate development of increment one for the system.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.506	2.244	1.013
RDT&E Articles Quantity	0	0	0

FY08 Conducted studies relative to system integration onto vehicles, and assessed capability of laser technology to neutralize IEDs.
FY09 Conducted technology development efforts relative to the use of laser energy to neutralize or disrupt insensitive munitions.
FY10 Continue technology Development for JLONS in preparation for the formal acquisition program.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.800	1.200	3.100
RDT&E Articles Quantity	0	0	0

FY08 Conducted integration of various EOD tools and sensors onto the MK 1 MOD 0 and MK 2 MOD 0 EOD Robot systems.
FY09 Completed development of improved command and control for EOD Robotic systems.
FY10 Initiate Advanced EOD Robot System acquisition project. *Advanced EOD Robot System consists of multiple interoperable robot systems. The first class of robot and the architecture for the system will be developed first, then the other classes of robots will be developed.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.489	1.000	1.000
RDT&E Articles Quantity	0	0	0

FY08 Achieved Full Rate Production on the TCM, AN/PLT-6460.
FY09 Conducted continuous improvement subprojects for the fielded TCM systems.
FY10 Make improvements to fielded TCM systems to include loadset refinements.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	0.500
RDT&E Articles Quantity	0	0	0

FY08 N/A
FY09 N/A

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**	

FY10 Initiate project to develop EOD required capabilities onto small unmanned aerial systems.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

(Funds listed in Section D. are for Cost Codes VN075 - EOD Equipment/Systems; GW1X1 - Title IX Supplemental and VNG86 OCO OIF Supplemental.)

* OPN 5509 Title IX Supplemental Funding

** OPN 5509 VNG86 OCO OIF Supplemental Funding

Line Item No. and Name	FY 2008	FY 2009	FY 2010	FY10 OCO					Total Cost
OPN 5509	6.209	28.105	10.663						44.977
OPN 5509 OCO	0.000	0.000	0.000	18.000					18.000
* OPN 5509 Title IX Supplemental	64.400	0.000	0.000						64.400
** OPN 5509 OCO OIF Supplemental	36.200	0.000	0.000						36.200

D. ACQUISITION STRATEGY:

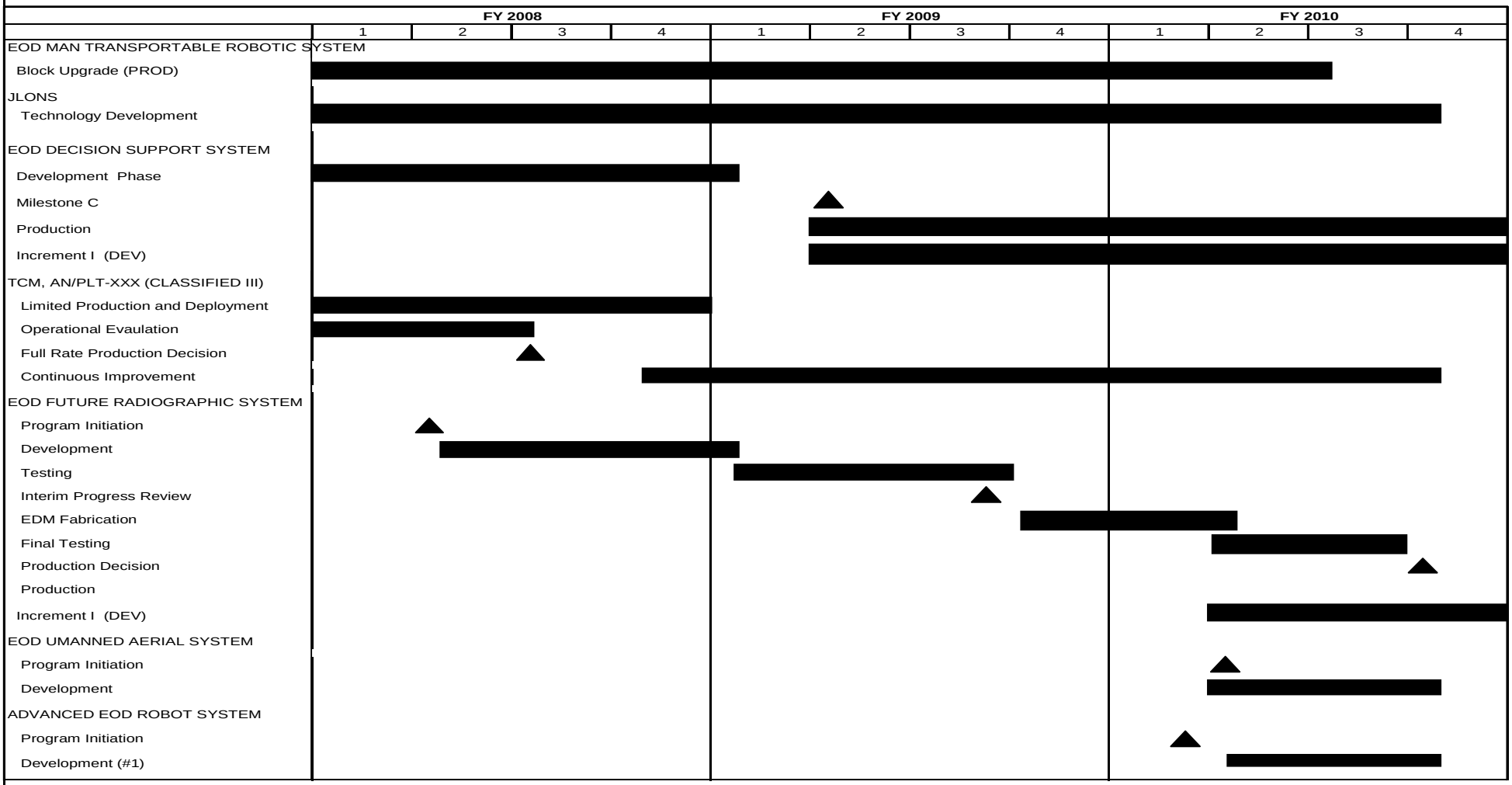
Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the subprojects' life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

E. MAJOR PERFORMERS:

The majority of funding in this line is executed by Naval Explosive Ordnance Disposal Technology Division located in Indian Head, MD in FY08 through FY10. The funding is used for development of Joint Service EOD tools/equipment. The funding document will be issued as follows: FY08-10/07; FY10-10/09.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE**			PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**					
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
Primary Hardware Development	WX	EODTD, IH, MD	112.552	4.642	OCT-08	4.900	OCT-09		CONT	0.000
Software Development	WX	EODTD, IH, MD	17.470	1.200	OCT-08	1.500	OCT-09		20.170	0.000
ILS	WX	EODTD, IH, MD	41.920	1.000	OCT-08	1.250	OCT-09		44.170	0.000
Subtotal Product Development			**171.942**	**6.842**		**7.650**			**CONT**	**0.000**
Remarks:										
Program Management Support	C/CPFF	ITT, Alrington, VA	3.460	0.000		0.000			3.460	0.000
Program Management Support	C/CPFF	ITT, Alrington, VA	2.495	0.500	OCT-08	0.166	OCT-09		CONT	0.000
Subtotal Support Costs			**5.955**	**0.500**		**0.166**			**CONT**	**0.000**
Remarks:										
Developmental Test & Evaluation	WX	EODTD, IH, MD	66.247	1.800	OCT-08	1.800	OCT-09		69.847	0.000
Operational Test & Evaluation	WX	EODTD, IH, MD	9.333	0.200	OCT-08	0.650	OCT-09		10.183	0.000
Subtotal Test and Evaluation			**75.580**	**2.000**		**2.450**			**80.030**	**0.000**
Remarks:										
Program Management Support	WX	EODTD, IH, MD	7.146	0.650	OCT-08	0.700	OCT-09		8.496	0.000
Miscellaneous	Various	Various	12.724	1.633	OCT-08	1.580	OCT-09		CONT	0.000
Subtotal Management Services			**19.870**	**2.283**		**2.280**			**CONT**	**0.000**
Remarks:										
Total Cost			**273.347**	**11.625**		**12.546**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVEL**	PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPME**			PROJECT NUMBER AND NAME **0377/JT Service Expl Ord Disp System**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
EOD MAN TRANSPORTABLE ROBOTIC SYSTEM							
Block Upgrade (PROD)	1Q-4Q	1Q-4Q	1Q-3Q				
Technology Development	1Q-4Q	1Q-4Q	1Q-4Q				
EOD DECISION SUPPORT SYSTEM							
Development Phase	1Q-4Q	1Q					
Milestone C		2Q					
Production		2Q-4Q	1Q-4Q				
Increment I (DEV)		2Q-4Q	1Q-4Q				
TCM,AN/PLT-XXX (CLASSIFIED III)							
Limited Production and Deployment	1Q-4Q						
Operational Evaluation	1Q-3Q						
Full Rate Production Decision	3Q						
Continous Improvement	4Q	1Q-4Q	1Q-4Q				
EOD FUTURE RADIOGRAPHIC SYSTEM							
Program Initiation	2Q						
Development	2Q-4Q	1Q					
Testing		1Q-3Q					
Interim Progress Review		4Q					
EDM Fabrication		4Q	1Q-2Q				
Final Testing			2Q-3Q				
Production Decision			4Q				
Increment I (DEV)			2Q-4Q				
EOD UNMANNED AERIAL SYSTEM							
Program Initiation			2Q				
Development			2Q-4Q				
ADVANCED EOD ROBOT SYSTEM							
Program Initiation			1Q				
Development # 1			2Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMEN**				PROJECT NUMBER AND NAME **1317/EOD Diving System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	2.699	2.746	3.535				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provides for development of Diver Safety/Life Support Equipment, Advanced Diver Integrated Sensors and Advanced Firing Systems to support Navy Explosive Ordnance Disposal (EOD) underwater operations. The equipment must have inherently low acoustic and magnetic signatures in order to allow the EOD divers to safely approach, render-safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines and unexploded ordnance. This project supports the Naval Mine Warfare Certification Plan.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDTEN/BA 4	**0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	**1317/EOD Diving System**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.905	0.290	0.846
RDT&E Articles Quantity	0	0	0

Diver Safety & Life Support Systems: Develop diver safety tools to include more capable life support systems for EOD, and Mobile Diving & Salvage Units (MDSU) operations. Specific tools include but are not limited to Underwater Breathing Apparatus (UBA), specialized dive masks, heads-up displays, and emergency life support systems.

FY08 Plan: Completed Navy certification and full rate production decision.
FY09 Plan: Initiate development of Improvement for Diver Safety related to EOD and UBA.
FY10 Plan: Develop and test improvements to the Very Shallow Water (VSW)/EOD UBA to enhance diver safety. Develop and test an EOD system (METRES) to detect and measure EOD diver and MCM equipment influence signatures.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.860	2.196	2.239
RDT&E Articles Quantity	0	0	0

Advanced Diver Integrated Sensors: Develop Advanced Diver Integrated Sensors equipment to enhance EOD and MDSU ability to detect, neutralize and gather intelligence on underwater targets of interest. Requirements include Diver Hull Inspection Navigation System (DHINS) and improvements to the Underwater Imaging System (UIS).

FY08 Plan: Initiated DHINS functional specification to be completed by FY08 with Fleet Evaluation.
FY09 Plan: UIS improvement system integration and testing will continue through FY09 with ECP approval planned for FY2010. DHINS LRIP planned for FY09.
FY10 Plan: Complete system integration and testing of the DHINS final production configuration.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.934	0.260	0.450
RDT&E Articles Quantity	0	0	0

Advanced Firing System: Develops new acquisitions and product improvements to existing systems for below and above water neutralization of underwater threats to support EOD and MDSU operations.

FY08 Plan: Acoustic Firing System (AFS) Spiral 1 Engineering Change Proposal (ECP) approval is scheduled for 2nd quarter FY08.
FY09 Plan: Initiate systems integration and testing of spiral 2 AFS that provides a Radio Frequency (RF) capability.
FY10 Plan: Continue system integration and testing of the spiral 2 AFS.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	**1317/EOD Diving System**	

C. OTHER PROGRAM FUNDING SUMMARY:

Funds listed in section C. are under cost code UQ034

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
OPN 0975	0.000	2.581	0.000						2.581
OPN 0977	0.000	0.000	2.200						2.200
PANMC 0340	1.692	0.000	1.754						3.446

D. ACQUISITION STRATEGY:

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisition strategies of the most cost-effective solution over the sub-projects life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.

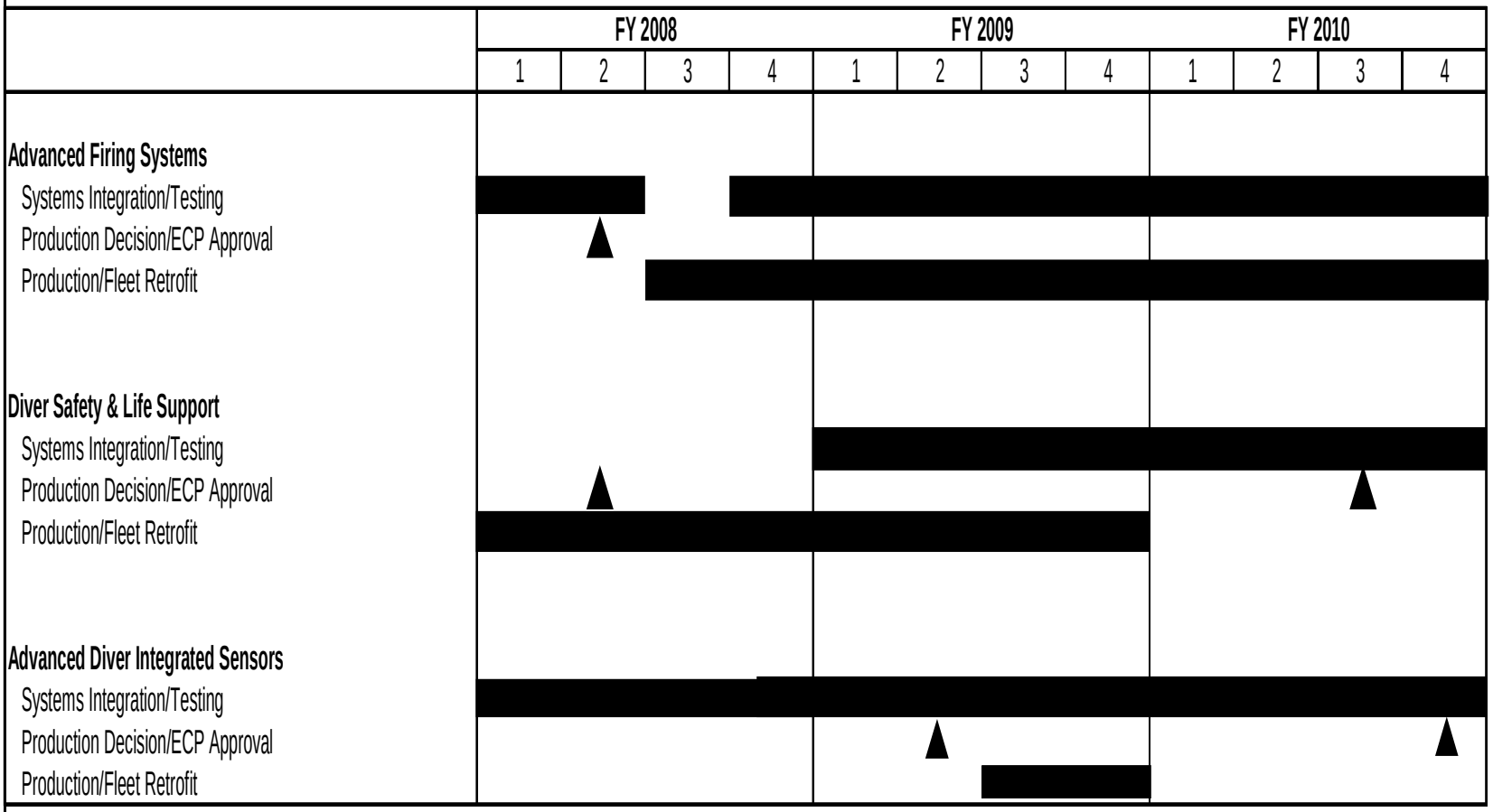
E. MAJOR PERFORMERS:

The majority of funding in this line is executed by Naval Explosive Ordnance Disposal Technology Division located in Indian Head, MD in FY08 through FY10. The funding is used for development of Underwater EOD tools/equipment. The funding document will be issued as follows: FY09-10/08, FY10-10/09.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE**			PROJECT NUMBER AND NAME **1317/EOD Diving System**					
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
Primary Hardware Development	WX	EODTD, IH, MD	37.327	0.801	OCT-08	0.907	OCT-09		39.035	0.000
Software Development	WX	EODTD, IH, MD	3.192	0.500	OCT-08	0.300	OCT-09		3.992	0.000
Systems Engineering	WX	EODTD, IH, MD	8.228	0.000		0.000			8.228	0.000
ILS	WX	EODTD, IH, MD	11.916	0.000		0.000			11.916	0.000
Systems Engineering	WX	NSWC, PC	0.570	0.190	OCT-08	0.250	OCT-09		1.010	0.000
Systems Engineering	WX	SPAWAR	1.000	0.400	OCT-08	0.500	OCT-09		1.900	0.000
Subtotal Product Development			**62.233**	**1.891**		**1.957**			**66.081**	**0.000**
Remarks:										
Program Management Support	C/CPFF	ITT, Arlington, VA	3.537	0.000		0.000			3.537	0.000
Program Management Support	C/CPFF	ITT, Arlington, VA	1.611	0.390	OCT-08	0.430	OCT-09		2.431	0.000
Integrated Logistics Support			0.000	0.000		0.000			0.000	0.000
Configuration Management			0.000	0.000		0.000			0.000	0.000
Technical Data			0.000	0.000		0.000			0.000	0.000
GFE			0.000	0.000		0.000			0.000	0.000
Award Fees			0.000	0.000		0.000			0.000	0.000
Subtotal Support Costs			**5.148**	**0.390**		**0.430**			**5.968**	**0.000**
Remarks:										
Development Test & Evaluation	WX	EODTD, IH, MD	4.273	0.070	OCT-08	0.700	OCT-09		5.043	0.000
Operational Test & Evaluation	WX	EODTD, IH, MD	1.560	0.000		0.000			1.560	0.000
Subtotal Test and Evaluation			**5.833**	**0.070**		**0.700**			**6.603**	**0.000**
Remarks:										
Program Management Support	WX	EODTD, IH, MD	8.122	0.290	OCT-08	0.350	OCT-09		8.762	0.000
Miscellaneous	WX	VARIOUS	6.631	0.105	OCT-08	0.098	OCT-09		6.834	0.000
Subtotal Management Services			**14.753**	**0.395**		**0.448**			**15.596**	**0.000**
Remarks:										

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE D**			PROJECT NUMBER AND NAME **1317/EOD Diving System**					
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
Total Cost			**87.967**	**2.746**		**3.535**			**94.248**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVEL**	PROJECT NUMBER AND NAME **1317/EOD Diving System**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPME**			PROJECT NUMBER AND NAME **1317/EOD Diving System**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
ADVANCED FIRING SYSTEMS							
System Integration/Testing	1Q-2Q; 4Q	1Q-4Q	1Q-4Q				
Production Decision/ECP Approval	2Q						
Production/Fleet Retrofit	3Q-4Q	1Q-4Q	1Q-4Q				
DIVER SAFETY & LIFE SUPPORT							
System Integration/Testing		1Q-4Q	1Q-4Q				
Production Decision/ECP Approval	2Q		3Q				
Production/Fleet Retrofit	1Q-4Q	1Q-4Q					
ADVANCED DIVER INTEGRATED SENSORS							
System Integration/Testing	1Q-4Q	1Q-4Q	1Q-4Q				
Production Decision/ECP Approval		2Q	4Q				
Production/Fleet Retrofit		3Q-4Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMEN**				PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	59.631	96.170	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provides for the research, development, for all military services against Radio Controlled Improvised Explosive Devices (RCIED) to prevent initiation. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Electronic Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted and fixed site operations. CREW development to make rapid improvements to performance, supportability and affordability.

* JCREW Spirals 3.1 and 3.2 are interim solutions funded by the Joint IED Defeat Organization (OSD)
* Beginning in FY10 the Joint Counter Radio Controlled IED Electronic Warfare program will move to PE 0604653N.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare***

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	59.631	96.170	0.000
RDT&E Articles Quantity	0	0	0

- FY08 - Acquisition planning and risk reduction for a Joint CREW 3.3 system of systems in preparation of Milestone B decision. Developed CREW Convoy Planning Tool upgrades.

- FY09 - Award contracts for the development of Joint CREW 3.3 system. Continue development of CREW Convoy Planning Tool upgrades.

*Beginning in FY10 the Joint Counter Radio-Controlled IED Electronic Warfare program will move to PE 0604653N.

C. OTHER PROGRAM FUNDING SUMMARY:

FY08 - Acquisition planning and risk reduction for a Joint CREW 3.3 system of systems in preparation of Milestone B decision. Developed CREW Convoy Planning Tool upgrades.

FY09 - Award contracts for the development of Joint CREW 3.3 system. Continue development of CREW Convoy Planning Tool upgrades.

D. ACQUISITION STRATEGY:

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost effective solution over subprojects' life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Procurements across the services will be combined to gain quantity discounts.

E. MAJOR PERFORMERS:

TBD - Performers will be selected based upon a competitive process.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMEN**				PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	4.112	3.586	4.973				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provides for development of small affordable, unmanned underwater systems to support Explosive Ordnance (EOD). Mobile Diving and Salvage Units, and Very Shallow Water (VSW) Mine Countermeasures (MCM) mission operations. The equipment must be highly portable in order to support the EOD technician to safely approach, render safe, recover, exploit and dispose of underwater explosive threats to include sea mines, limpet mines and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense, MCM, including clandestine reconnaissance and mine clearance in support of amphibious operations. Development of EOD UUV systems to support localization render-safe and detailed intelligence gathering of UXO including Underwater Improvised Explosive Devices. This project supports the Naval Mine Warfare Certification Plan.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.112	3.586	4.973
RDT&E Articles Quantity	0	0	0

This program supports development, testing and Fleet approval for evolving generations of small affordable Unmanned Underwater Vehicles (UUV), support equipment, and common operator interface systems to address validated requirements in support of Explosive Ordnance Disposal and VSW MCM mission areas. Mission areas include: open and confined areas, hulls, piers and pilings to search, classify, map, re-acquire, identify, and neutralize sea and limpet mines and underwater improvised explosive devices.

FY08 Plan: Initiated production of 2nd Generation system Required Identified (R-I). Continue requirements definition for 3rd Generation UUV Neutralization (UUV-N) system. Completed production and delivery of 2nd Generation (R-1) systems.

FY09 Plan: Continue Spiral Continuous Improvement Program (CIP) for 1st and 2nd Generation systems (includes Bottom UUV Localization System (BULS)). Complete requirements definition for 3rd Generation System. Initiate User Operational Evaluation System (UOES) test and evaluation phase for UUV-N.

FY10 Plan: Continue UUV-N UOES testing. Insert mature technologies and validate system retrofit upgrades to VSW MCM and BULS UUVs (continuous improvement program (CIP)) to enhance performance in harsh environments in accordance with ONR technology transition agreements (TTAs). Transition ONR Hull UUV Localization System (HULS) Rapid Technology Transition initiative. Begin UOES prototype testing and validation of HULS.

C. OTHER PROGRAM FUNDING SUMMARY:

Funds listed in section C. are under cost code UQ034

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
OPN 0975	4.825	2.203							7.028
OPN 0977			7.350						7.350

D. ACQUISITION STRATEGY:

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisitions strategies of the most cost-effective solution over the sub-projects' life -cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modifications), non-developmental item (including modifications), and lastly, developmental programs. Contracting for RDT&E, if required is always competitive and when feasible, production options are included.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOI**	PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**

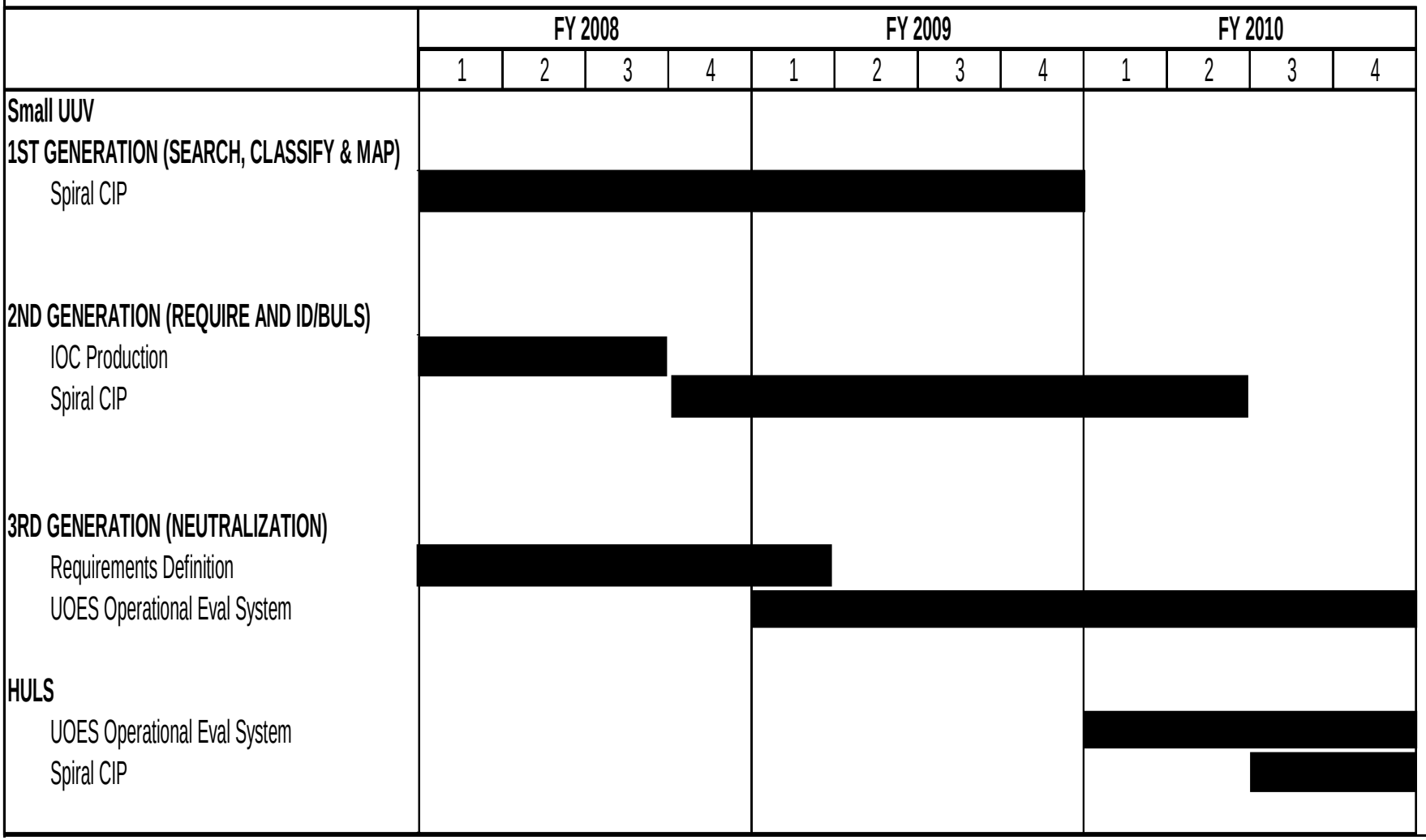
This ongoing program capitalizes on a User Operational Evaluation System (UOES) effort involving Fleet operators engaged in tactical experimentation with prototype UUVs. These UUV operators also participate in detailed requirements analyses and definition. Operational capabilities with UUV have been realized at designated EOD units, with a competitive acquisition strategy. The addition of enhanced capabilities through an evolutionary acquisition approach to the UUV toolbox is programmed for delivery in accordance with approved CNO requirements and ONR TTAs. Further improvements to the toolbox to add basic mine and underwater explosive threats neutralization capabilities will be pursued.

E. MAJOR PERFORMERS:

The majority of funding in this line is executed by Naval Explosive Ordnance Disposal Technology Division located in Indian Head, MD FY08 through FY10. The funding is used for development of Unmanned Underwater Vehicle(s). The funding document will be issued as follows: FY08-10/07; FY08-10/08; FY10-10/09;

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DE**			PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**					
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
Primary Hardware Development	WX	EODTD,IH,MD	13.260	1.094	OCT-08	1.656	OCT-09		16.010	0.000
Systems Engineering	WX	EODTD,IH,MD	9.228	0.998	OCT-08	1.140	OCT-09		11.366	0.000
Subtotal Product Development			**22.488**	**2.092**		**2.796**			**27.376**	**0.000**
Remarks:										
Program Management Support	C/CPFF	ITT, ARLINGTON, VA	2.517	0.463	OCT-08	0.600	OCT-09		3.580	0.000
			0.000	0.000		0.000			0.000	0.000
Subtotal Support Costs			**2.517**	**0.463**		**0.600**			**3.580**	**0.000**
Remarks:										
Developmental Test & Evaluation	WX	EODTD,IH,MD	4.511	0.600	OCT-08	0.920	OCT-09		6.031	0.000
Operational Test & Evaluation	WX	EODTD,IH,MD	0.959	0.142	OCT-08	0.250	OCT-09		1.351	0.000
Subtotal Test and Evaluation			**5.470**	**0.742**		**1.170**			**7.382**	**0.000**
Remarks:										
Program Management Support	WX	EODTD,IH,MD	1.348	0.173	OCT-08	0.250	OCT-09		1.771	0.000
Miscellaneous	WX	VARIOUS	0.979	0.116	OCT-08	0.157	OCT-09		CONT	0.000
Subtotal Management Services			**2.327**	**0.289**		**0.407**			**CONT**	**0.000**
Remarks:										
Total Cost			**32.802**	**3.586**		**4.973**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVEL**	PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603654N/JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPME**			PROJECT NUMBER AND NAME **4023/VSM MCM/Force Protection UUV**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
1ST GENERATION SMALL UUV (SEARCH, CLASSIFY & MAP)							
Spiral CIP	1Q-4Q	1Q-4Q					
2ND GENERATION (REQUIRE AND ID)/BULS							
IOC Production	1Q-3Q						
Spiral CIP	4Q	1Q-4Q	1Q-2Q				
3RD GENERATION (NEUTRALIZATION)							
Requirements Definition	1Q-4Q	1Q					
UOES Operational Eval System		1Q-4Q	1Q-4Q				
HULS							
UOES Operational Eval System			1Q-4Q				
SPIRAL CIP			3Q-4Q				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603658N/COOPERATIVE ENGAGEMENT**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	34.916	42.999	56.586				
2039 / COOP Engagement	31.060	38.212	56.586				
9999 / CONGRESSIONAL ADDS	3.856	4.787	0.000				

A. MISSION DESCRIPTION:

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture capable of fire control quality. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System modifications. The DDS encodes and distributes ownship sensor and engagement data and is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor that is able to process force levels of data in near real-time. This data is passed to the ship's combat system as high quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them.

The Navy has begun implementation of a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, comms independence. SDP will provide hardware which complies with Category 3 Open Architecture Computing Environment (OACE) standards with rehosted existing software, which will be fielded fleet-wide to allow affordable replacement of obsolete computing system components and eliminate dependencies on "closed" equipment, operating systems, and middleware.

Additionally, CEC is working with Joint Program Executive Office Single Integrated Air Picture (JPEO SIAP) to jointly engineer a sensor measurement fusion and track management algorithm set of solutions which is viable for all Services to implement toward achieving optimum interoperability across the battlespace. This effort supports re-architecting of battle force functionality in order to support the Navy's Open Architecture functional architecture which establishes a common functional framework across Navy programs and platforms to reduce development cost by promoting software reuse. This architecture promotes interoperability by allowing functionality to be consistently engineered across the battlespace. The Joint Track Manager (JTM) is derived from an Integrated Architecture Behavior Model (IABM) through a series of configuration deliveries which will include JTM functionality. General Dynamics was competitively awarded the Systems Integrator/Design Agent (SI/DA) contract in March 2005 to facilitate the development, integration, and testing of the JTM functionality across the applicable Navy Programs (e.g. DDG 1000, E-2).

National Security Agency (NSA) Cryptologic requirements necessitate redesign of CEC SDP to incorporate Sierra II Crypto Chip. NSA has published a classified future date at which

time keymat will no longer be available for the current design. In regard to SDP Backfit, COMOPTEVFOR found the AN/USG-3 (E-2C Airborne CEC) Operationally Effective, but not Operationally Suitable. Reliability and availability issues are addressed by the replacement of four Weapons Replaceable Assemblies (WRAs) with the new SDP. Backfit of the SDP in the E-2C will resolve suitability issues and address National Security Agency (NSA) directed Crypto Modernization requirements with funding provided in FY10.

In regard to Large Nets, Spiral 1 responds to emergent needs of operational forces and missions. Provides an extensible foundation for capability growth. Provides interoperability with legacy units in Global Mode. Spiral 2 in conjunction with Spiral 1 efforts will provide a 3X increase in DDS network size. This is needed to improve multiple battle group operations and support CEC/IABM interoperability. Applicable ships and systems include all CEC deployed units and future fielding to include CG/DDG Modernization, IABM, and its Pathfinder Programs. Data Distribution System (DDS) must increase nodes to enable Joint Network Warfare Capabilities with funding provided in FY10.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	36.513	38.316	49.248
FY10 President's Budget	34.916	42.999	56.586
Total Adjustments	-1.597	4.683	7.338
(U) Summary of Adjustments			
Congressional Adjustments	0.000	4.800	0.000
SBIR/STTR/FTT Assessment	-0.274	0.000	0.000
Program Adjustments	-1.162	0.000	8.200
Rate/Misc Adjustments	-0.161	-0.117	-0.862
Total	-1.597	4.683	7.338

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
PE 0206313M - RDT&E, N (Marine Corps)	1.300	0.600	0.000						1.900
BLI 019500 - E-2D PPAs	15.975	0.000	0.000						15.975
BLI 0102419A - RDT&E JLENS (Army)	11.000	5.391	6.150						22.541
BLI 227300 - Procurement, Marine Corps	3.000	7.000	10.000						20.000
BLI 260600 - Cooperative Engagement Capability/OPN	27.634	28.975	30.522						87.131
BLI 0960 - CG Modernization/OPN	9.385	4.841	14.668						28.894
BLI 019500 - E-2D Aircraft/APN	0.000	13.049	13.365						26.414
ICN 52860161 - JLENS (Army) Procurement	0.000	0.000	0.000						0.000
Various - SCN Procurement	11.847	8.495	22.253						42.595
BLI 0900 - DDG Modernization/OPN	0.000	0.000	4.967						4.967

D. ACQUISITION STRATEGY:

A revision to the August 2004 Acquisition Plan (AP) was approved on 29 August 2007. The AP includes procurement requirements for the CEC from FY08-FY10 to support USN ship and Aircraft programs, the USMC Composite Tracking Network (CTN), and the Army's Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS). The AP includes requirements for the competitive procurement of the Compact Solid State Antenna (CSSA) for the USMC CTN and USA JLENS programs for FY09 and FY10. The AP provides for CEC System Design Agent and Engineering Services for FY08-FY10. This AP also identifies the requirement for continued Low Rate Initial Production (LRIP) authority for the E-2D CEC system. Incremental LRIP mitigates program and design risk by linking CEC procurements to E-2D program events and testing results. The incremental LRIP strategy was presented to an Acquisition Strategy Integrated Product Team (ASIPT) on July 14, 2008. The meeting resulted in authorization to proceed to an FY09 LRIP Overarching Integrated Product Team (OIPT) in the September 2008 timeframe. Eighteen E-2D systems are planned to be procured under LRIP Authority from FY09 through FY10.

E. MAJOR PERFORMERS:

General Dynamics Advanced Information Systems /Fairfax, Virginia/Systems Integration / Design Agent
Raytheon Systems Company/St. Petersburg, FL/Development of AN/USG-2 (shipboard) and AN/USG-3(airborne)equipment.
Johns Hopkins University, Applied Physics Laboratory/Laurel, MD / Technical Design Agent for AN/USG-2 and AN/USG-3 equipment.
Northrop-Grumman Corporation/Bethpage LI, NY/Integration of AN/USG-3 equipment with E-2C HAWKEYE 2000 and Advanced E2 aircraft.
Naval Surface Warfare Center / Pt. Hueneme, CA / Test and Evaluation.
Naval Surface Warfare Center/Dahlgren, VA/Software Support Activity (SSA) and Systems Engineering/Integration Agent (SE/IA).
Sechan/Lititz, PA/Signal Data Processor.
SAIC/St. Petersburg, FL/Mini Terminal.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**				PROJECT NUMBER AND NAME **2039/COOP Engagement**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	31.060	38.212	56.586				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture capable of fire control quality. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and Combat System modifications. The DDS encodes and distributes ownship sensor and engagement data and is a high capacity, jam resistant, directive system providing a precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor that is able to process force levels of data in near real-time. This data is passed to the ship's combat system as high quality data for which the ship can cue its onboard sensors or use the data to engage targets without actually tracking them.

The Navy has begun implementation of a Single Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, comms independence. SDP will provide hardware which complies with Category 3 Open Architecture Computing Environment (OACE) standards with rehosted existing software, which will be fielded fleet-wide to allow affordable replacement of obsolete computing system components and eliminate dependencies on "closed" equipment, operating systems, and middleware.

Additionally, CEC is working with Joint Program Executive Office Single Integrated Air Picture (JPEO SIAP) to jointly engineer a sensor measurement fusion and track management algorithm set of solutions which is viable for all Services to implement toward achieving optimum interoperability across the battlespace. This effort supports re-architecting of battle force functionality in order to support the Navy's Open Architecture functional architecture which establishes a common functional framework across Navy programs and platforms to reduce development cost by promoting software reuse. This architecture promotes interoperability by allowing functionality to be consistently engineered across the battlespace. The Joint Track Manager (JTM) is derived from an Integrated Architecture Behavior Model (IABM) through a series of configuration deliveries which will include JTM functionality. General Dynamics was competitively awarded the Systems Integrator/Design Agent (SI/DA) contract in March 2005 to facilitate the development, integration, and testing of the JTM functionality across the applicable Navy Programs (e.g. DDG 1000, E-2).

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**	PROJECT NUMBER AND NAME **2039/COOP Engagement**

In regard to SDP Backfit, COMOPTEVFOR found the AN/USG-3 (E-2C Airborne CEC) Operationally Effective, but not Operationally Suitable. Reliability and availability issues are addressed by the replacement of four Weapons Replaceable Assemblies (WRAs) with the new SDP. Backfit of the SDP in the E-2C will resolve suitability issues and address National Security Agency (NSA) directed Crypto Modernization requirements with funding provided in FY10.

In regard to Large Nets, Spiral 1 responds to emergent needs of operational forces and missions. Provides an extensible foundation for capability growth. Provides interoperability with legacy units in Global Mode. Spiral 2 in conjunction with Spiral 1 efforts will provide a 3X increase in DDS network size. This is needed to improve multiple battle group operations and support CEC/IABM interoperability. Applicable ships and systems include all CEC deployed units and future fielding to include CG/DDG Modernization, IABM, and its Pathfinder Programs. Data Distribution System (DDS) must increase nodes to enable Joint Network Warfare Capabilities with funding provided in FY10.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**	PROJECT NUMBER AND NAME **2039/COOP Engagement**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
E-2D	8.578	10.430	3.650
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued CEC integration efforts with E-2D.
FY09 Plan: Continue CEC integration efforts with E-2D.
FY10 Plan: Continue CEC integration efforts with E-2D.

	FY 2008	FY 2009	FY 2010
B/L 2.1 INTEGRATION AND FOT&E TESTING	3.400	4.000	10.200
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued development, integration and testing of computer program Baseline 2.1 for ACDS, AEGIS, and SSDS platforms. Complete FOT&E-4 test analysis, continue SDP test analysis.
FY09 Plan: Continue development, integration and testing of computer program Baseline 2.1 for ACDS, AEGIS, and SSDS platforms. Begin FOT&E-5 testing and analysis. Continue SDP test analysis.
FY10 Plan: Continue development, integration and testing of computer program Baseline 2.1 for Aegis, E-2D and SSDS platforms. Begin FOT&E-6 testing and analysis. Continue SDP test analysis.

	FY 2008	FY 2009	FY 2010
NIFC-CA	1.100	2.850	2.080
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued CEC integration efforts with NIFC-CA.
FY09 Plan: Continue CEC integration efforts with NIFC-CA.
FY10 Plan: Continue CEC integration efforts with NIFC-CA.

	FY 2008	FY 2009	FY 2010
SYSTEMS ENGINEERING/INTEGRATION AGENT	1.300	1.564	1.612
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren.
FY09 Plan: Continue Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren.
FY10 Plan: Continue Systems Engineering/Integration Agent (SE/IA) for development and execution of systems engineering processes by NSWC, Dahlgren.

	FY 2008	FY 2009	FY 2010
SYSTEM IMPROVEMENTS	8.810	11.309	26.547
RDT&E Articles Quantity	0	0	0

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**	PROJECT NUMBER AND NAME **2039/COOP Engagement**

FY08 Plan: Continued CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent and engineering services.

FY09 Plan: Continue CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent and engineering services.

FY10 Plan: Continue CEC system improvements including enhanced communications, expansion of networking capability, development of system protection/multi-level secure operational-level secure operations, Cryptologic Modernization, design agent, engineering services, Signal Data Processors and Large Nets.

	FY 2008	FY 2009	FY 2010
JOINT OPERATIONS	0.594	1.500	1.500
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued minimal participation in system interoperability exercises and Joint Integrated Demonstrations.

FY09 Plan: Continue participation in system interoperability exercises and Joint Integrated Demonstrations.

FY10 Plan: Continue participation in system interoperability exercises and Joint Integrated Demonstrations.

	FY 2008	FY 2009	FY 2010
FIELD ACTIVITIES	7.278	6.559	10.997
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued field activity support of CEC development efforts (I.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support.

FY09 Plan: Continue field activity support of CEC development efforts (I.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support.

FY10 Plan: Continue field activity support of CEC development efforts (I.e. Technical Direction Agent, In-Service Engineering, Integrated Logistics Support Planning) and program management support.

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NA **0603658N/COOPERATIVE ENGAGEMEI**			PROJECT NUMBER AND NAME **2039/COOP Engagement**					
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
AN/USG-2/3 Development	CPFF	Raytheon, St. Petersburg, FL	20.326	4.375	OCT-08	18.770	OCT-09		CONT	0.000
AN/USG-2/3 Development/TDA	CPFF	JHU/APL, Laurel, MD	18.946	8.000	OCT-08	8.000	OCT-09		34.946	0.000
SI/DA	CPAF	General Dynamics	23.979	0.000		0.000			23.979	46.657
SI/DA	CPAF	Award Fees	2.903	0.000		0.000			2.903	16.423
P3I	CPAF	Raytheon	11.475	0.000		0.000			11.475	60.727
DDG 1000	CPAF	Raytheon, Massachusetts	10.983	0.000		0.000			10.983	10.130
DDG 1000	CPAF	Award Fee	0.447	0.000		0.000			0.447	0.000
NIFC-CA Integration	Various	Various	26.629	2.850	NOV-08	2.080	NOV-09		31.559	0.000
In-Service Engineering Activity	WX	NSWC, Port Hueneme, CA	0.357	0.000	NOV-08	0.250	NOV-09		0.607	0.000
Software Support Activity/SEIA	WX	NSWC, Dahlgren, VA	6.500	1.564	NOV-08	1.612	NOV-09		9.676	0.000
Production Engineering Activity	WX	NSWC, Crane, IN	3.094	0.000	NOV-08	1.000	NOV-09		4.094	0.000
JTRS	Various	Various	8.500	0.000		0.000			8.500	15.000
Various	Various	Miscellaneous	6.065	2.904	JAN-09	6.674	JAN-10		15.643	0.000
NAVSSI	WX	SPAWAR, San Diego, CA	0.368	0.000		0.000			0.368	0.000
Certification	MP	NSA, Fort Meade, MD	0.300	0.125	NOV-08	0.250	NOV-09		0.675	0.000
Certification	WX	SPAWAR, Charleston, SC	0.780	0.000		0.000			0.780	0.000
MSI/NCCT	MP	Wright Pat AFB, Dayton, OH	1.228	0.000		0.000			1.228	0.000
Joint Exercises	WX	NSWC, Corona, CA	0.744	1.500	NOV-08	1.500	NOV-09		3.744	0.000
LBTS Testing	WX	CDSA, Dam Neck, VA	1.770	1.000	NOV-08	1.000	NOV-09		3.770	0.000
Testing Support	PD	Wallops Island	2.066	0.564	NOV-08	0.600	NOV-09		3.230	0.000
E-2D Integration	Various	Various	20.468	10.430	JAN-09	3.650	JAN-10		34.548	0.000
Subtotal Product Development			**167.928**	**33.312**		**45.386**			**CONT**	**148.937**

Remarks:

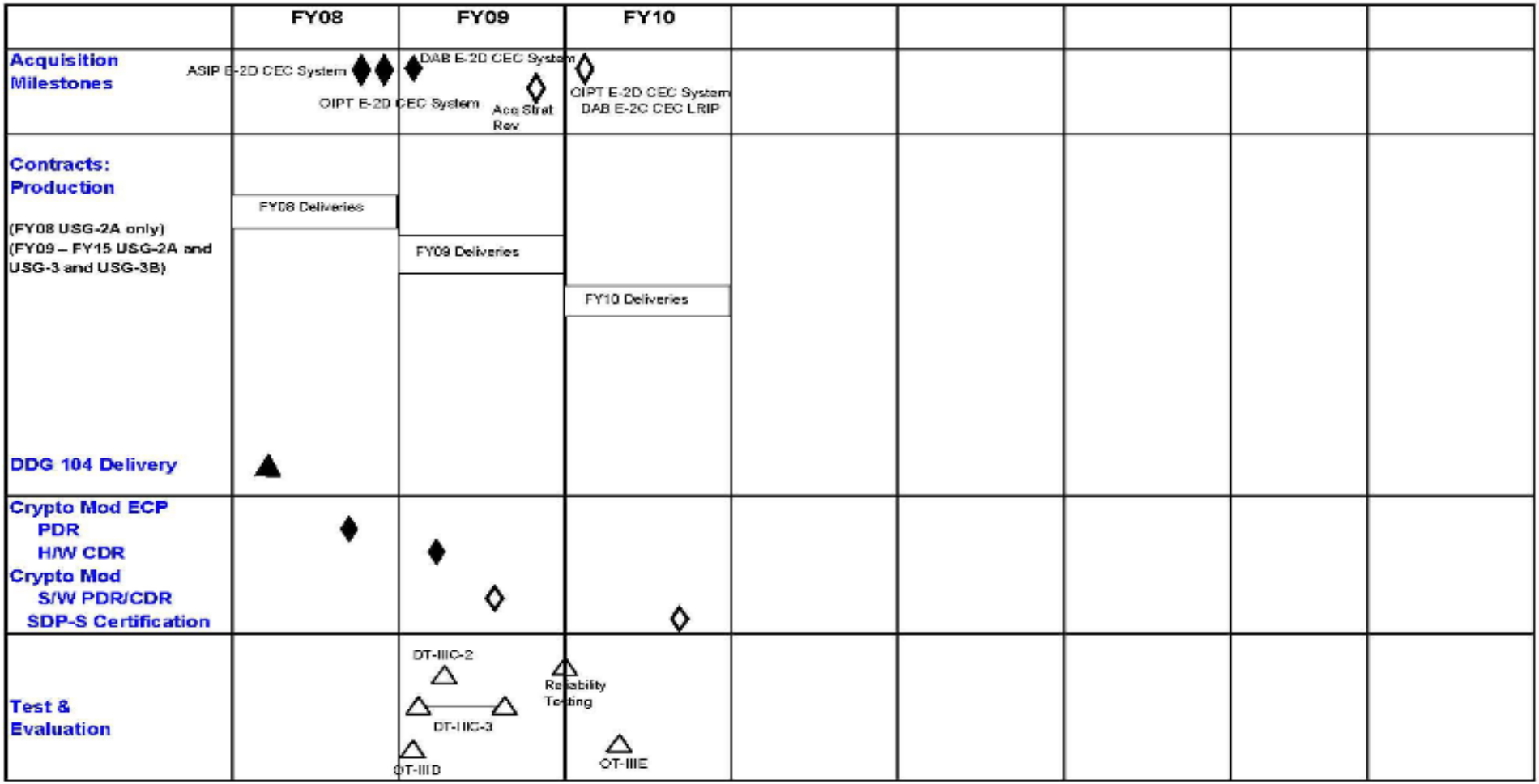
Explanations for the use of "WX, MP, and PD" in the "Contract method & type" column are as follows:

When using "MP", these documents are issued to DOD activities that are outside of the Department of the Navy.

When using "WX", these documents are sent to Navy activities who obligate funding on their vehicles to accomplish tasking for CEC. These activities are the only ones who can accomplish these tasks for the program.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS								DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**			PROJECT NUMBER AND NAME **2039/COOP Engagement**					
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
When using "PD" for Wallops Island, this document is used because this is the only document we can provide to the activity to accomplish taskings for the CEC program.										
Subtotal Support Costs			**0.000**	**0.000**		**0.000**			**0.000**	**0.000**
Remarks:										
Test Support	CPAF	Raytheon, St. Petersburg, FL	0.000	0.000		0.540	NOV-09		0.540	0.000
Test Support	CPFF	JHU/APL, Laurel, MD	0.000	0.000		0.080			0.080	0.000
Test Support	WX	NRL, Washington DC	0.313	0.000		0.000			0.313	0.000
Test Support	WX	NSWC, PHD, CA	6.276	2.100	OCT-08	3.332	OCT-09		CONT	0.000
Air Operations Test Support	WX	NAVAIR (PMA207)	1.426	0.200	OCT-08	2.038	OCT-09		CONT	0.000
Test Data Reduction Analysis	WX	NWAS, Corona, CA	3.268	1.500	OCT-08	2.450	OCT-09		CONT	0.000
Test Support	WX	COMOPTEVFOR, VA	1.729	0.200	OCT-08	1.760	OCT-09		CONT	0.000
Various	Various	Various	0.000	0.000		0.000			0.000	0.000
Subtotal Test and Evaluation			**13.012**	**4.000**		**10.200**			**CONT**	**0.000**
Remarks: Explanation for the use of "WX" in the "Contract method & type" column are as follows: When using "WX", these documents are sent to Navy activities who obligate funding on their vehicles to accomplish tasking for CEC. These activities are the only ones who can accomplish these tasks for the program.										
Program Management Support	FFP	Various	1.530	0.900	OCT-08	1.000	OCT-09		3.430	0.000
Subtotal Management Services			**1.530**	**0.900**		**1.000**			**3.430**	**0.000**
Remarks:										
Total Cost			**182.470**	**38.212**		**56.586**			**CONT**	**148.937**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**	PROJECT NUMBER AND NAME **2039/COOP Engagement**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**			PROJECT NUMBER AND NAME **2039/COOP Engagement**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
ASIPT E-2D CEC System	4Q08						
DAB E-2D CEC System		1Q09					
Acquisition Strategy Review		4Q09					
OIPT E-2D CEC System	4Q08		1Q10				
DAB E-2C CEC LRIP			1Q10				
FY08 USG-2A Production Delivery	3Q08						
FY09-FY10 USG-2A/USG-3A Production Deliveries		1Q09	1Q10				
DDG 104 Delivery	1Q08						
Crypto Mod ECP PDR	3Q08						
Crypto Mod ECP H/W CDR		2Q09					
Crypto Mod S/W PDR		3Q09					
Crypto Mod S/W CDR		3Q09					
SDP-S Certification			3Q10				
DT-III-C-2		2Q09					
DT-III-C-3		1Q09-3Q09					
OT-III-D		1Q09					
Reliability Testing		4Q09					
OT-III-E			2Q10				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603658N/COOPERATIVE ENGAGEMENT**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	3.856	4.787	0.000
RDT&E Articles Quantity	0	0	0

FY08 Plan: Continued CEC system improvements including enhanced communications, expansion of capability, and development of system protection/multi-level secure operational-level operations.

FY09 Plan: Continued CEC system improvements including enhanced communications, expansion of capability, and development of system protection/multi-level secure operational-level operations.

FY10 Plan: None.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	8.812	7.716	17.328				
0099 / Deep Submergence Bio Med Dev	3.295	3.277	3.313				
0394 / Shallow Depth Diving EQ	5.517	4.439	14.015				

A. MISSION DESCRIPTION:

Developments in this program will enable the U.S. Navy to overcome deficiencies that constrain underwater operations in the areas of search, location, rescue, recovery, salvage, construction, and protection of offshore assets. This program develops medical technology, diver life support equipment, and the vehicles, systems, tools, and procedures to permit manned underwater operations.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	5.080	7.737	17.591
FY10 President's Budget	8.812	7.716	17.328
Total Adjustments	3.732	-0.021	-0.263
(U) Summary of Adjustments			
Congressional Adjustments	0.000	-0.021	0.000
Program Adjustments	3.732	0.000	0.000
Rate/Misc Adjustments		0.000	-0.263
Total	3.732	-0.021	-0.263

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0099/Deep Submergence Bio Med Dev**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	3.295	3.277	3.313				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Develops advanced biomedical and bioengineering technology for enhancing medical and life support for submarine escape and rescue; and for diver safety and effectiveness; supports deeper, longer, and more flexible dives. Deliverables for DISSUB (disabled submarine) include: medical procedures for submarine escape and rescue (including new Submarine Rescue Diving and Recompression System (SRDRS)), life support parameters, medical procedures for life support, exposure guidance for atmospheric contaminants, non-chemical CO2 scrubbing, prevention and treatment of decompression illness, and senior survivor expert decision system. Deliverables for diver enhancement include: exposure guidance for diver underwater continuous noise, impulse noise, and underwater blast, exposure guidance for oxygen breathing, collection of operational diving depth/time profiles to predict decompression risk, and enhanced underwater swimming efficiency. Requirements: NAPDD #587-873, Deep Submergence Biomedical Development, 23 November 1999.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPM**	PROJECT NUMBER AND NAME **0099/Deep Submergence Bio Med Dev**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.000	1.959	1.967
RDT&E Articles Quantity	0	0	0

Diver Health and Safety Research: Pulmonary oxygen toxicity exposure limits. Procedures for assessing and mitigating risk for diving in contaminated water. Procedure to determine remaining CO2 scrubber duration. Development of advanced insulation garments for diver thermal protection. Develop final guidance for warm water diving. Continue collection of operational dive profiles for advanced modeling. Submarine ballast tank air quality survey. Novel methods for diver thermal protection. Improve resistance to O2 toxicity. Diver anthropometry. Chemical hardening of diving equipment. Predictive index of visual and auditory O2 toxicity. Guidelines for flying after diving. Guidelines for infra- and ultra-sound diver exposure. Develop an advanced diver thermal model. Guidelines for ballast tank diving. Protective gear for diver noise exposure. Electronic collection of operational dive data.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.295	1.318	1.346
RDT&E Articles Quantity	0	0	0

Submarine Rescue: Decompression procedures for pressurized SRDRS operators. Use of perfluorocarbons to accelerate decompression in submarine rescue. Adjunctive therapies for treating DISSUB survivors. Guidance for food, water, clothing, medical supplies to enhance survival of submarine crews awaiting rescue. Flexible computer generated decompression schedules for wide range of conditions in a DISSUB. Develop DISSUB triage procedures. DISSUB survival trial. Develop oxygen metabolizer for closed vehicles. Accelerate decompression by negative pressure breathing. Treatment guidance for decompression sickness and arterial gas embolism in submarine escape and rescue. Interventions for toxicological problems with rescued submariners. Minimizing decompression sickness and arterial gas embolism with Submarine Escape and Immersion Suit (SEIS) training. Use of pharmacologic agents to reduce decompression risk in submarine rescuees.

C. OTHER PROGRAM FUNDING SUMMARY:

Not Applicable

D. ACQUISITION STRATEGY:

Integrated thrust area teams (e.g. decompression research) are established with university, commercial and in-house Navy lab to jointly execute biomedical R&D; peer review of research proposals accomplished by independent Technical Advisory Board; annual review of progress by Executive Review Board (CNO/NAVSEA/ONR/BUMED); program management by 0-6 Medical Dept Officer; contracting by competitive process using BAA and leveraging ONR capabilities.

E. MAJOR PERFORMERS:

Navy Experimental Diving Unit (NEDU) (Oct/each FY) is the center for manned diving biomedical research and development for the Navy. All Navy manned diving research facilities were consolidated at NEDU during the last BRAC.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0099/Deep Submergence Bio Med Dev**						
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
Primary Hardware Development			0.000			0.000		0.000				
Ancillary Hardware Development			0.000			0.000		0.000				
Component Development			0.000			0.000		0.000				
Ship Integration			0.000			0.000		0.000				
Ship Suitability			0.000			0.000		0.000				
Systems Engineering			0.000			0.000		0.000				
Training Development			0.000			0.000		0.000				
Licenses			0.000			0.000		0.000				
Tooling			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
Subtotal Product Development			**0.000**			**0.000**		**0.000**				
Remarks:												
Development Support			0.000			0.000		0.000				
Software Development			0.000			0.000		0.000				
Training Development			0.000			0.000		0.000				
Integrated Logistics Support			0.000			0.000		0.000				
Configuration Management			0.000			0.000		0.000				
Technical Data			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
Subtotal Support Costs			**0.000**			**0.000**		**0.000**				
Remarks:												
Developmental Test & Evaluation	WR	NEDU	8.053			2.064	OCT-08	2.090	OCT-09			
Developmental Test & Evaluation	WR	NRC	0.927			1.000	OCT-08	1.000	OCT-09			
Operational Test & Evaluation			0.000			0.000		0.000				
Live Fire Test & Evaluation			0.000			0.000		0.000				

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0099/Deep Submergence Bio Med Dev**						
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
Test Assets			0.000			0.000		0.000				
Tooling			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fee			0.000			0.000		0.000				
Subtotal Test and Evaluation			**8.980**			**3.064**		**3.090**				
Remarks:												
Contractor Engineering Support			0.000			0.000		0.000				
Government Engineering Support			0.000			0.000		0.000				
Program Management Support	Various	Various	0.000			0.000		0.000				
Travel			0.058			0.035	TBD	0.045	TBD			
Labor (Research Personnel)			0.000			0.000		0.000				
*SBIR Assessment	Various	Various	0.182			0.178	TBD	0.178	TBD			
Subtotal Management Services			**0.240**			**0.213**		**0.223**				
Remarks:*SBIR Assessment inludes other extramural program assessments.												
Total Cost			**9.220**			**3.277**		**3.313**				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	5.517	4.439	14.015				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project is to develop systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems.

(SRDRS) to provide a new rapidly deployed emergency submarine rescue capability. SRDRS fills the gap created by the decommissioned USS PIGEON (ASR 21) and USS ORTOLAN (ASR 22) and provide a new capability of pressurized transportation of rescuees from a stricken submarine directly to the decompression system eliminating the requirement for Deep Submergence Rescue Vehicles and Mother Submarines. SRDRS is to include an air transportable rapid assessment/underwater work system, a decompression chamber system and a pressurized rescue module. The SRDRS will provide a global rapid response capability to support submarine rescue missions with an increase in capability at a fraction of the cost of the currently available systems.

Shallow Depth Diving Equipment managed under SEA00C - This project develops systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. Current plans are to perform R&D in the areas of contaminated water diving, diver thermal protection, and diver sound protection.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPM**	PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.304	3.155	12.782
RDT&E Articles Quantity	0	0	0

Continue design, fabrication and acceptance testing of the prototype Submarine Decompression System and support equipment. Continue integration of all SRDRS components.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.213	1.284	1.233
RDT&E Articles Quantity	0	0	0

Continue research on contaminated water diving and begin research on diver thermal protection and diver sound protection.

C. OTHER PROGRAM FUNDING SUMMARY:

Not Applicable

D. ACQUISITION STRATEGY:

The Submarine Rescue system (SRS) segment of the SRDRS is largely based on the use of Commercial-Off-the-Shelf (COTS) technology and maximum use of Non-Developmental Items (NDI). The SRS segment is being procured using performance based specifications. Many of the SRS contracts were awarded competitively and were based on technical capability and cost considerations (best value). Program management of SRDRS is accomplished through the use of Program Executive Officer, Submarines (PEO SUB) leadership. This change was enacted in February 2003 realigning the responsibility from SEA00C to PEOSUB. The Prototype system will provide full operational capability and no additional procurement is planned. The system is designed to be Government Owned/Commercially Operated (GO/CO).

E. MAJOR PERFORMERS:

Oceaneering International is providing systems engineering and integration support for the SRS. Oceanworks, Inc. is the detailed designer and fabricator of the Pressurized Rescue Module.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**						
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
Primary Hardware Development			0.000			0.000		0.000				
Ancillary Hardware Development			0.000			0.000		0.000				
Design, System Integration			0.000			0.000		0.000				
Decompression Chambers (SDC1 and 2)			0.000			0.000		0.000				
Various Mission Support Equipment (MSE)			0.000			0.000		0.000				
Pressurized Rescue Module System (PRMS)	CPIF	Oceanworks	23.824			0.000		0.000				
PRMS	FFP	Oceanworks	4.150			0.000		0.000				
Various PRMS MSE			0.000			0.000		0.000				
Systems Engineering - Design, Integration	Various	Oceaneering	3.428			2.504	OCT-08	10.951	OCT-09			
Systems Engineering - Technical	Various	Various	0.537			0.000		0.000				
Licenses			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
			0.000			0.000		0.000				
Subtotal Product Development			**31.939**			**2.504**		**10.951**				

Remarks:

1. Restructuring or rephasing of non-rescue related subsystems and components done with N773 and CNSF staff concurrence.

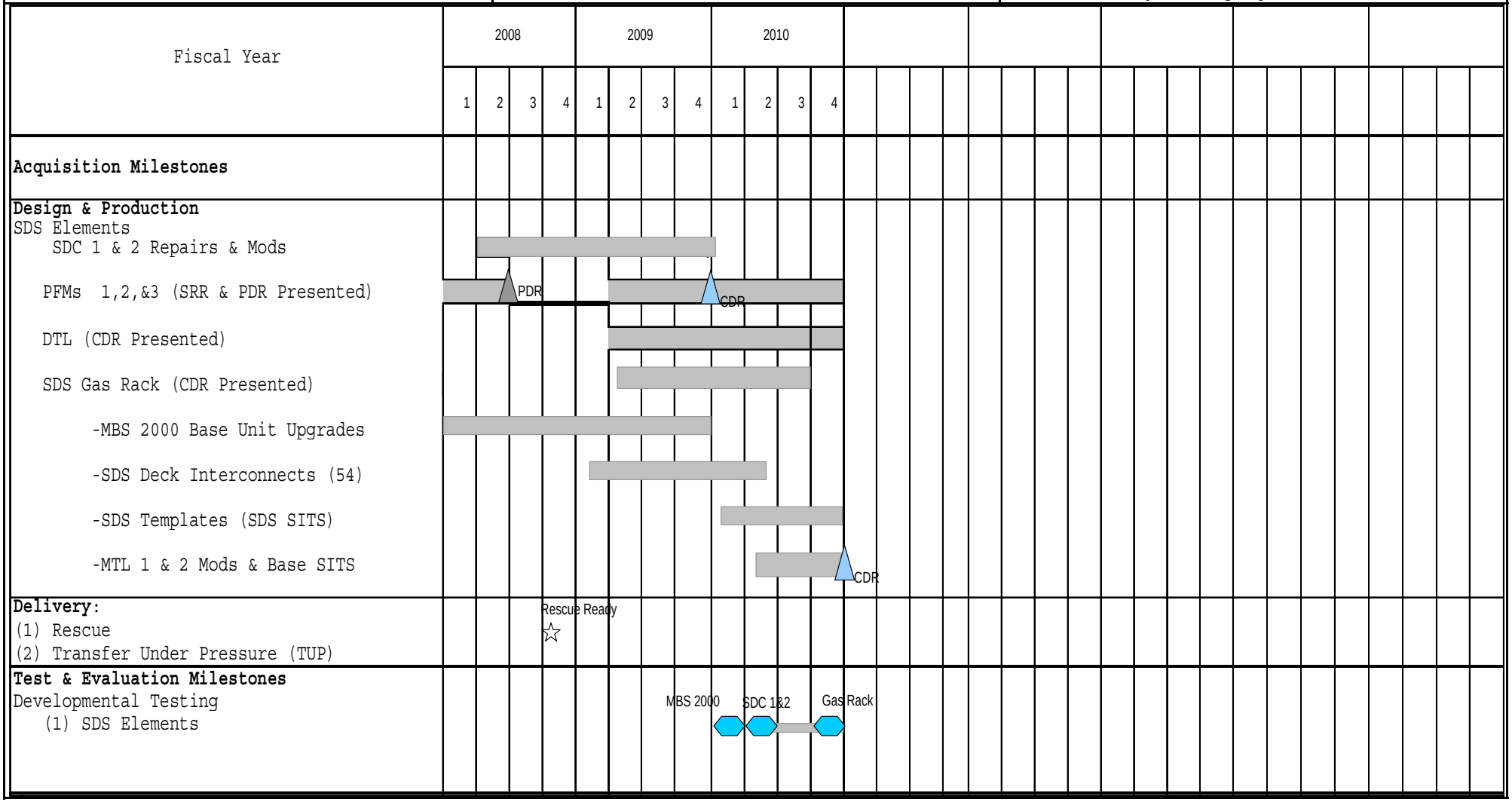
2. SDC-1 and SDC-2 chambers were originally under a FFP contract through NFESC with a Contract completion date (CCD) of 31 August 2003 which was missed. A settlement agreement was reached and the incomplete chambers were shipped to Oceaneering for completion.

3. Adjustments for Oceanworks PRMS cost growth negotiated between NAVSEA 02 and Canadian Commercial Corporation; contract converted to Firm Fixed Price (FFP).

Development Support	Various	Various	1.213			1.284	NOV-08	1.233	NOV-09			
Software Development			0.000			0.000		0.000				
Integrated Logistics Support			0.000			0.000		0.000				
Integrated Logistics Support	Various	Miscellaneous	0.841			0.000		0.000				

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**						
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
Configuration Management	CPAF	Oceaneering	0.489			0.000		0.000				
Technical Data			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
Subtotal Support Costs			**2.543**			**1.284**		**1.233**				
Remarks:												
Developmental Test & Evaluation	Various	Miscellaneous	3.187			0.000		0.000				
Operational Test & Evaluation	WR	COMOPTEVFOR	0.400			0.050	NOV-08	0.075	NOV-09			
Subtotal Test and Evaluation			**3.587**			**0.050**		**0.075**				
Remarks:												
Contractor Engineering Support	Various	QBS/Various	0.074			0.000		0.000				
Government Engineering Support	WR	NFESC	0.197			0.000		0.000				
Government Engineering Support	MIPR	DOI	0.000			0.000		0.000				
Government Engineering Support	WR	PSNSY, Various	1.940			0.180	NOV-08	0.036	NOV-09			
Government Engineering Support	Various	Miscellaneous	1.686			0.000		0.086	NOV-09			
Program Management Support	Various	Miscellaneous	0.706			0.381	NOV-08	1.559	NOV-09			
Travel	Various	Various	0.289			0.040	TBD	0.075	TBD			
SBIR Assessment			0.443			0.000		0.000				
Subtotal Management Services			**5.335**			**0.601**		**1.756**				
Remarks:												
Total Cost			**43.404**			**4.439**		**14.015**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOP**	PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**



CLASSIFICATION:	UNCLASSIFIED							
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**				PROJECT NUMBER AND NAME **0394/Shallow Depth Diving EQ**			
Schedule Profile	FY 2008	FY 2009	FY 2010					
SDC 1 & 2 Repairs & Mods	2Q-4Q	1Q-4Q	1Q					
PFMs 1,2,&3 (SRR & PDR Presented)	1Q-4Q	1Q-4Q	1Q-4Q					
PFM PDR	2Q							
PFM CDR		4Q						
DTL (CDR Presented)		2Q-4Q	1Q-4Q					
SDS Gas Rack (CDR Presented)		2Q-4Q	1Q-3Q					
MBS 2000 Base Unit Upgrades	1Q-4Q	1Q-4Q						
SDS Deck Interconnects (54)		1Q-4Q	1Q-2Q					
SDS Templates (SDS SITS)			1Q-4Q					
MTL 1 & 2 Mods & Base SITS			2Q-4Q					
MTL 1 & 2 Mods & Base SITS CDR			4Q					
Rescue Ready	4Q							
SDS Elements			1Q-4Q					
MBS 2000			1Q					
SDC 1 & 2			2Q					
Gas Rack			4Q					

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603721N/ENVIRONMENTAL PROTECTION**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	20.413	20.740	20.661				
0401 / Shipboard Waste Mgmt	5.609	6.796	6.050				
0817 / Pollution Abatement	7.550	8.379	5.761				
9204 / Marine Mammal Research	6.097	4.367	8.850				
9999 / Congressional Add	1.157	1.198	0.000				

A. MISSION DESCRIPTION:

(U) Many environmental laws, regulations, and policies impose restrictions on Navy vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance. This program develops and evaluates processes, hardware, systems, and operational procedures that will allow the Navy to operate in U.S., foreign, and international waters, air, space, and land areas while complying with environmental laws, regulations, Executive Orders, policies and international agreements. Projects support the Navy's compliance with OPNAVINST 5090.1C and other DoD and Navy environmental-related policies; the Clean Water Act, Clean Air Act, Act to Prevent Pollution from Ships, National Environmental Policy Act, Marine Plastic Pollution Research and Control Act, Endangered Species Act, Marine Mammal Protection Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, U.S. Public Vessel Medical Waste Anti-Dumping Act, and Federal Facility Compliance Act; and Executive Orders 12088, 12114, 12843, 13089, 13101, 13112, 13148, and 13158. Project 0401 supports RDT&E efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in four major areas: ozone depleting substances, liquid wastes, solid wastes, and hazardous and other wastes. Project 2210 supports RDT&E that enables Navy compliance with environmental laws, regulations and policies impacting the basing, re-alignment, operation, repair, and replacement of Naval aircraft in four major areas: engine emissions, air vehicle hazardous materials and wastes, ozone depleting substances, and aviation shipboard emissions. Project 0817 supports RDT&E to develop and validate technologies to enable Navy facilities to comply with environmental laws, regulations, and policies in a cost-effective manner. Project 9204 supports RDT&E to develop planning and monitoring tools for minimizing Fleet contacts with and potential harassment (physiological and behavior) of marine animals including threatened and endangered species in response to Federal laws and regulations and public scrutiny.

(U) Project 9999 is comprised of Congressional adds.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603721N/ENVIRONMENTAL PROTECTION**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	20.618	19.632	20.309
FY10 President's Budget	20.413	20.740	20.661
Total Adjustments	-0.205	1.108	0.352
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0.000	-0.056	0.000
SBIR/STTR/FTT Assessment	-0.192	0.000	0.000
Program Adjustments	-0.013	1.200	0.490
Rate/Misc Adjustments	0	-0.036	-0.138
Total	-0.205	1.108	0.352

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**				PROJECT NUMBER AND NAME **0401/Shipboard Waste Mgmt**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	5.609	6.796	6.050				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) Navy ships and submarines must routinely operate in U.S., international, and foreign waters, and visit numerous U.S. and foreign ports. No body of water is without environmental restrictions that impact the movements and operations of Navy vessels. Environmental requirements tend to be most restrictive in port and in coastal waters, where the Navy's increasing littoral presence places ships and submarines in discharge-restricted waters for longer periods of time. Growing international cooperation in addressing global environmental concerns is resulting in expanding areas of ocean considered environmentally susceptible, where special prohibitions on ship discharges and operations are imposed. Navy vessels must comply with applicable environmental legal requirements while maintaining continued access to all waters for operations, exercises, training, and port access. The large crews and limited onboard space of Navy ships and submarines severely constrain their ability to hold wastes for return to port for shoreside disposal. This project develops and evaluates shipboard waste processing equipment, systems, and data to enable ships and submarines to manage their wastes in an environmentally-compliant, safe, and operationally-compatible manner. It also addresses afloat environmental issues other than shipboard wastes, e.g., hull antifouling and access to environmental data for planning Fleet operations and exercises.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603721N/ENVIRONMENTAL PROTECTION**	**0401/Shipboard Waste Mgmt**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Technical Authority	1.809	2.600	2.000
RDT&E Articles Quantity	0	0	0

FY08: (U) Develop environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.

FY09: (U) Continue developing environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.

FY10: (U) Develop environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.

	FY 2008	FY 2009	FY 2010
Integrated Liquid Wastes	2.700	2.900	3.000
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue support of rule making process with Environmental Protection Agency (EPA) in development of Uniform National Discharge Standards (UNDS) for liquid waste discharges from Naval vessels; continue discharge analyses and setting of Marine Pollution Control Devices (MPCD) performance standards. Continue development of MPCD treatment systems, technologies and procedures.
Continue evaluation of commercial waste water systems.

FY09: (U) Continue support rule making process in development of UNDS. Continue development of MPCD treatment systems, technologies and procedures, and evaluation of COTS waste water systems.

FY10: (U) Continue support rule making process in development of UNDS. Continue development of MPCD treatment systems, technologies and procedures, and evaluation of COTS waste water systems.

	FY 2008	FY 2009	FY 2010
Hazardous and Other Major Ship Wastes	1.100	1.296	0.650
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings.

FY09: U) Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings.

FY10: (U) Continue shipboard hazardous materials substitution and elimination process, and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0401/Shipboard Waste Mgmt**

	FY 2008	FY 2009	FY 2010
Ballast Water Exchange	0.000	0.000	0.400
RDT&E Articles Quantity	0	0	0

FY10: (U) Conduct surveys of Amphibious Warfare Ships to explore feasible engineering enhancements reduce the time and/or and manpower involved in executing ballast water double exchange. Develop and document double exchange procedures and guidance procedures and prepare documentation and training materials for the new ballast water management guidance. Investigate ballasting data logging options.

C. OTHER PROGRAM FUNDING SUMMARY:

(U) Demonstrated and validated technologies are transitioned to various SCN, OPN, and O&MN budget accounts for implementation as part of a Fleet modernization program or new ship construction.

(U) Related RDT&E: (U) Defense Research Sciences/Shipboard Processes (PE 0601153N / 3162)

(U) Related RDT&E: (U) Readiness, Training, and Environmental Quality/Logistics and Environmental Quality (PE 0602233N)

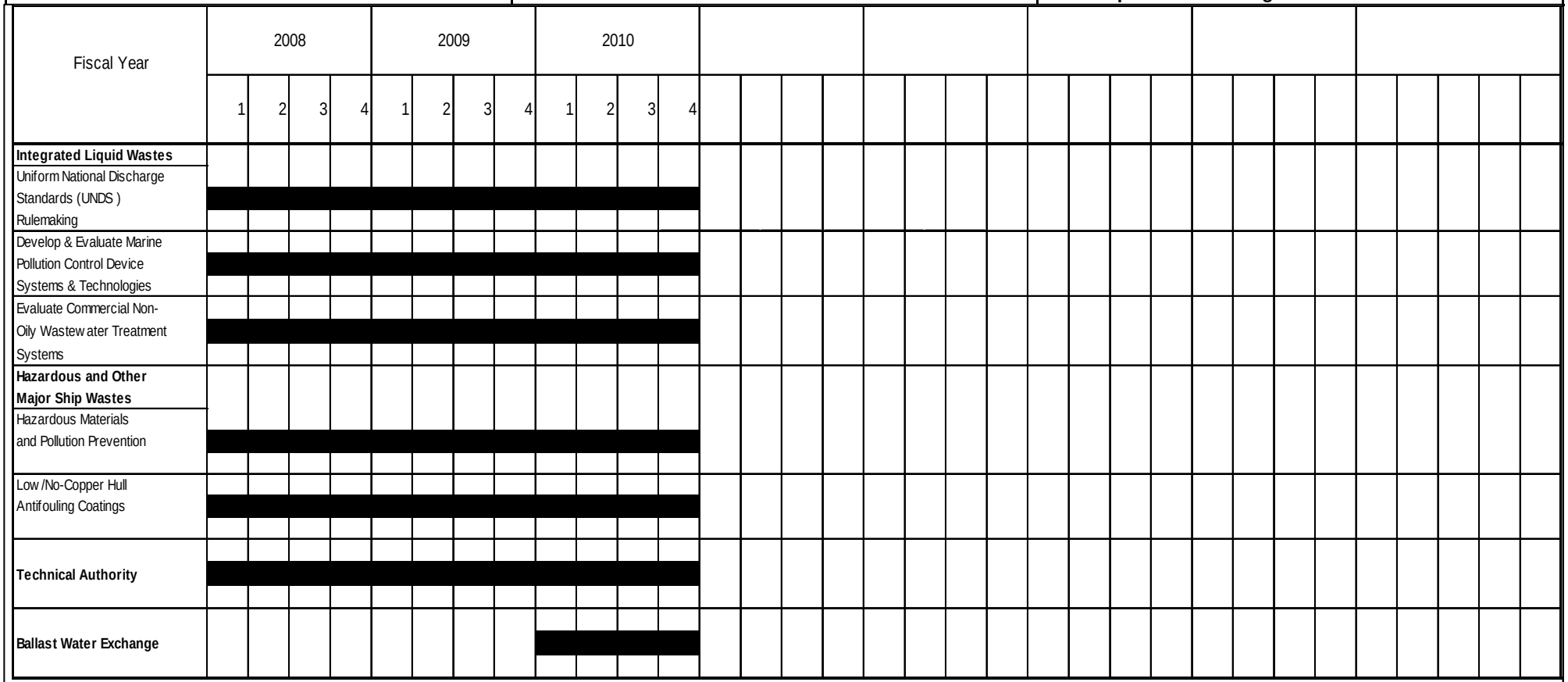
D. ACQUISITION STRATEGY:

(U) RDT&E Contracts are Competitive Procurements.

E. MAJOR PERFORMERS:

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **0401/Shipboard Waste Mgmt**					
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
Ancillary Hardware Development	Various	Misc. Contracts	19.149	0.000		0.000				
Primary Hardware Development	C/CPFF	Oceaneering	1.000	0.000		0.000				
Systems Engineering	C/CPFF	John J. McMullen & Son	4.487	0.000		0.000				
Subtotal Product Development			**24.636**	**0.000**		**0.000**				
Remarks:										
Software Development	WR	SPAWARS, Charleston, SC	10.838	0.000		0.000				
Subtotal Support Costs			**10.838**	**0.000**		**0.000**				
Remarks:										
Developmental Test & Evaluation	WR	NSWCCD, Bethesda, MD	160.272	5.436	VAR	4.810	VAR			
Developmental Test & Evaluation	WR	NRL,Wash,DC	29.954	0.300	VAR	0.200	VAR			
Developmental Test & Evaluation	WR	SPAWARSYSCEN,SD,CA	11.630	0.110	VAR	0.110	VAR			
Developmental Test & Evaluation	WR	Misc. Govt Labs	22.832	0.050	VAR	0.050	VAR			
Developmental Test & Evaluation	C/CPFF	SAIC, San Diego, CA	15.570	0.000		0.000				
Developmental Test & Evaluation	C/CPFF	Misc. Contracts	12.676	0.150	VAR	0.150	TBD			
Process Control Engineering	C/CPFF	M. Rosenblatt & Sons	5.150	0.740	VAR	0.720	TBD			
Developmental Test & Evaluation	C/CPFF	ONR, Arlington, VA	0.400	0.000		0.000				
Developmental Test & Evaluation	WR	Naval Postgraduate School	1.800	0.000		0.000				
Process Control Engineering	MIPR	EPA, Hdqtrs	0.840	0.000		0.000				
Subtotal Test and Evaluation			**261.124**	**6.786**		**6.040**				
Remarks:										
Travel	ALLOT	NAVSEA. Washington, DC	0.280	0.010	TBD	0.010				
SBIR Assessment			0.078	0.000		0.000				
Subtotal Management Services			**0.358**	**0.010**		**0.010**				
Remarks:										
Total Cost			**296.956**	**6.796**		**6.050**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0401/Shipboard Waste Mgmt**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **0401/Shipboard Waste Mgmt**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Integrated Liquid Wastes							
Uniform National Discharge Standards (UNDS) Rulemaking	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Develop & Evaluate Marine Pollution Control Device Systems & Technologies	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Evaluate Commercial Wastewater Treatment Systems	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Hazardous and Other Major Ship Wastes							
Hazardous Materials and Pollution Prevention	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Low/No-Copper Hull Antifouling Coatings	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Technical Authority	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Ballast Water Exchange			Q1 Q2 Q3 Q4				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**				PROJECT NUMBER AND NAME **0817/Pollution Abatement**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	7.550	8.423	5.803				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) Inherent to the realization of the vision outlined in Sea Power 21 are certain environmental consequences that will, to a lesser or greater degree, impact on the Navy's ability to fully achieve the strategy outlined in the Navy Capability Pillars (NCP) SEA SHIELD, SEA STRIKE, SEA BASING and FORCEnet and the supporting initiatives of SEA WARRIOR, SEA TRIAL and SEA ENTERPRISE. Readiness and training are primary considerations for determining whether any fighting force is at its peak proficiency. The ability to train our forces in a realistic environment is paramount. Today's reality requires training and operating within environmental constraints (national and international laws and agreements), and searching for alternatives to comply with and alleviate those constraints. Moreover, as we develop new systems and technologies in support of Sea Power 21, the Navy must anticipate potential environmental regulations which, while not currently an issue, could in the future adversely impact our ability to project and sustain our forces at home and abroad.

This program identifies pervasive Navy shoreside environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy. Program investments supports 4 of 5 Environmental Enabling Capabilities (EEC-2 though 5) that are required to meet the objectives of Sea Power 21 as detailed in the POM08 Integrated Navy Environmental Readiness Capability Assessment for Science and Technology (S&T) and Development, test and Evaluation (DT&E).

(U) EEC-2 MAXIMIZE TRAINING AND TESTING RANGE REQUIREMENTS WITHIN ENVIRONMENTAL CONSTRAINTS

(U) This capability addresses environmental impacts and restrictions at Navy land and sea ranges, including munitions testing and manufacturing, to ensure Navy ranges are available to conduct required training and testing operations for the Fleet. Investments in EEC-2 provide validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test ranges to maximize the availability and utilization of the ranges. The results support operational readiness by providing the tools and technologies necessary for sustaining and managing Navy land and sea ranges related to unexploded ordnance (UXO) and munitions, encroachment, air quality, airborne noise, water quality, and wetlands. Capabilities gained include the ability to assess and determine the risks from underwater UXO, the evaluation and prioritization ordnance contaminated sites for evaluation in environmental programs, and the implementation of range specific best management practices by evaluating and modeling available process, procedures, and technologies.

(U) EEC-3 PLATFORM MAINTENANCE AND REPAIR WITH MINIMAL ENVIRONMENTAL FOOTPRINT

(U) This capability focuses on minimizing or eliminating environmental impact related to Navy and Marine Corps weapon system repair and maintenance operations. Investments in EEC-3 provide valid knowledge, models, process, and technologies to minimize regulated emissions, discharges and hazardous material usage during the repair and maintenance of ships, submarines, and surface/sub-surface vehicles and aircraft and air vehicles. The program supports Fleet operational readiness and Navy acquisition communities by investing in information to understand emerging environmental requirements and to develop innovative processes and technologies that result in savings while reducing the fleet environmental constraints related to platform maintenance. Capabilities and benefits gained include, but are not limited to, the reduction in the usage of heavy metals used in metal finishing (chromium and cadmium), reduced hazardous air pollutant (HAP) emissions, and the development of best management practices and tools to minimize the use of hazardous materials and the generation of hazardous wastes associated with maintaining and repairing ships, submarines and aircraft and unmanned vehicles. Results of program investments will be leveraged across weapon system and platform acquisition to ensure continued reduction in lifecycle costs and long-term environmental compliance burdens to the Fleet.

(U) EEC-4. SUPPORT SHORE READINESS WITHIN ENVIRONMENTAL CONSTRAINTS

(U) Naval shore establishment requires the capability to operate and maintain facilities and provide waterfront and airfield services to the fleet while complying with applicable environmental regulations and minimizing environmental impacts and costs. The program invests in knowledge and innovative processes and technologies that minimize infrastructure and operational costs, regulated emissions, while minimizing discharges and hazardous material usage from ship (waterfront) and aviation operations. Capabilities and benefits gained under EEC-4 include reduced costs associated with wastewater treatment, elimination/reduction in the use of HAPs, ozone depleting substances (ODSs), and volatile organic compounds (VOCs), and the associated reporting requirements, reduced hazardous waste and disposal costs, and improved storm water management.

((U) EEC-5. COST-EFFECTIVE MANAGEMENT OF ENVIRONMENTAL REGULATORY REQUIREMENTS

(U) The environmental compliance regulations require base managers to permit, monitor and report on many processes associated with weapon system and platform operations. Naval shore environmental managers require the capability to efficiently and cost effectively manage these compliance requirements. Under EEC-5, the program invests in improved data collection, methods, and models to assess environmental impacts and ecological risk assessments of Naval operations on harbors, U.S. waterways, and surrounding communities. Benefits include gaining standardized technical environmental management improvements/techniques related to source control, assessment, and monitoring. EEC-5 also provides validated knowledge, models, processes and technologies to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0817/Pollution Abatement**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Maximize Training & Testing Requirements Within Environmental Constrain	1.980	2.273	2.096
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. The analysis of the long term disposition of seafloor cables will identify cable impacts to the marine environments aiding the sustainment and management of Navy underwater ranges and support new underwater surveillance systems that require the laying of seafloor hardware and cables. The initiation of the Seafloor Cable Baseline Assessment will establish a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Development of direct push and point-and-detect sensor systems, for use in the field, will allow the measurement of perchlorate either for rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters. Environmental risk associated with abandoned equipment in underwater ranges.

FY09: (U) Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continue the analysis of the long term disposition of seafloor cables will identify cable impacts to the marine environments aiding the sustainment and management of Navy underwater ranges and support new underwater surveillance systems that require the laying of seafloor hardware and cables. Continue the Seafloor Cable Baseline Assessment to establish a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Continued effort to assess environmental risk associated with abandoned equipment in underwater ranges. Sound Energy Model Assessment on underwater marine environment. Develop Checklist for BIP Scenarios.

FY10: (U) Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continued effort to assess environmental risk associated with abandoned equipment in underwater ranges. Continue the assessment of sound energy models on underwater marine environment. Conclusion of efforts on the Seafloor Cable Baseline Assessment will allow decision makers to determine a long term monitoring strategy for the underwater range. Seafloor cable laying strategies and decision tool. Determining the Phototoxic Properties of Energetic Contaminants in Aquatic Environments.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0817/Pollution Abatement**	

	FY 2008	FY 2009	FY 2010
Maintenance	1.892	2.477	0.794
RDT&E Articles Quantity	0	0	0

FY08: (U) The tasks in this EEC address ship and submarine Fleet and aircraft maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness. Continuing efforts will provide new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Analysis on acid recycle systems for pipe flushing wastes will identify technology alternatives and allow selection of a candidate system as a pier side integrated system to recycle and reuse of acid/heavy metal wastewater generated in submarine and surface ship pipe flushing operations and submarine missile tube cleaning. The development of an automated convergent spray process for non-skid coatings using 100% solid non-skid coating system will eliminate volatile organic compounds emissions during the application of non-skid on Navy vessels. Alternative solvents demonstrations for ship maintenance operations will be conducted to allow development of a decision tool to standardize the approach to hazardous material (HM) avoidance across ship and shore activities and identify alternatives for NAVSEA targeted chemicals. A data tool to determine what hazardous materials are consumed and what wastes are generated by ship platform maintenance will allow future pollution prevention efforts to focus on specific chemicals and the operations that use them. Material and component testing will validate high velocity oxygen fuel (HVOF) thermal spray coatings as a cost-effective and technologically superior alternative to the current hard chrome plating used on helicopter dynamic components. The use of HVOF coatings will result in a significant reduction in worker exposure to carcinogenic hexavalent chromium and increase service life of components. The use of low temperature powder coating will help minimize HAP/VOC emissions and the use of hexavalent chromium. Thin film sulfuric acid anodizing (TFSAA) with non-chromated sealers as an alternative to chrome acid anodizing will be evaluated to help the Navy meet the requirements of EO 13148 that requires a 50% reduction in use of hexavalent chromium by 31 December 2006. Zinc-nickel plating will be demonstrated as an acceptable replacement for cadmium plated repairs as a touch-up applications for high-strength steels. Suitable substitutes for polystyrene/polyester resins and chemical strippers used during repairs to radome will be demonstrated.

FY 09: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Complete aircraft sustainment related projects. Development of dry dock best management practices and decision selection tool assisting naval shipyards, stations and bases in meeting the copper discharge standards will conclude. Alternative solvents demonstrations for ship maintenance operations and identification of alternatives for NAVSEA targeted chemicals will continue. The development of hazardous material allocation information for ship maintenance will continue. Complete acid waste treatment project for cleaning shipboard heat exchangers. Demonstration of a hull bio-fouling cleaning/removal approach. Evaluation of Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls (PCBs) in Shipboard Materials

FY10: (U) Divest investments in EEC3 related to aircraft sustainment. Continue development of dry dock cleaning alternatives. Evaluation of Solvent Extraction Methodologies for the Extraction of Polychlorinated Biphenyls in Shipboard Materials Continue hull bio-fouling cleaning and removal technology. Tools/mitigation measures for coating operations on vessel freeboard areas. Elimination of Overspray in Shipbuilding and Facilities Maintenance Operations

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0817/Pollution Abatement**	

	FY 2008	FY 2009	FY 2010
Support Shore Readiness within Environmental Constraints	1.930	2.904	2.471
RDT&E Articles Quantity	0	0	0

FY 08: (U) Provide new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. The demonstration and validation of Improved best management practices (BMPs) - Stormwater Treatment Technology will enhance the management of stormwater run-off and reduce costs while addressing Navy unique requirements and ensuring compliance with stormwater discharge regulations. Continue the development and demonstration of a zinc removal filter for treating collected compensated ballast wastewater will reduce disposal and operation costs and preserve the capability to refuel Naval vessels in port. The development of a wastewater treatment system to collect and treat the waste stream for vertical launch missile tubes will improve submarine readiness while reducing the release of hazardous wastes to the environment. Initiate an investigation into the feasibility of the onshore treatment of ballast water to control the introduction of aquatic invasive species will provide an assessment tool to manage invasive species and minimize open-water ballast water exchanges. An assessment of drinking water supply security technologies will investigate potable water supply security system methodologies and technologies that are available or under development and assess their applicability to the security of Navy water supplies. An investigation and demonstration is planned to improve biofouling control and preventative maintenance planning to ensure permanent oil containment boom systems meet or exceed their intended 4-year service life.

FY09: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue selected demonstrations of alternative solvents for industrial operations. Continue the development of a wastewater treatment system to collect and treat the waste stream for vertical launch missile tubes. Continue investigating improved biofouling control and preventative maintenance planning for permanent oil containment boom systems. Continue Shoreside Ballast Water Treatment effort. Dry dock best management practices tool will assist naval shipyards, naval stations, and submarine bases in meeting the copper discharge standards for NPDES and Stormwater discharges.

FY10: (U) Integrating effort related to Shipboard Acid Waste Treatment Technology. This pier-side reclamation system separates heavy metal and marine fouling sludge to allow ship waste water to meet local sanitary sewer discharge limits. Validate a Shipboard Mobile Surface Cleaning Technology. Validation of a mobile surface cleaning technology for critical cleaning of shipboard non-skid and shoreside surfaces to remove contaminants, mitigate pollution from weather deck and stormwater runoff and reduce associated manpower and waste management burden. Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, and other base operations. Realign the program to focus on addressing the fleets high priority needs and investment in processes related to waterfront support to address risks associated with sea level rise and more frequent and intense storm events. Reduced Generation of Shoreside Managed Waste from Pierside Supported Underwater Ship Husbandry Operations.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0817/Pollution Abatement**	

	FY 2008	FY 2009	FY 2010
Cost-Effective Management of Environmental Regulatory Requirements	1.748	0.725	0.400
RDT&E Articles Quantity	0	0	0

FY08: (U) Provide validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. The identification, review, and demonstration of sediment transport methods and tools that assess physical stability and natural recovery potential at contaminated sediment sites will provide a defined framework that can be used by program mangers and their technical staff to clearly understand the kind of measurements needed at sites and how those measurements can be used to develop management decisions at contaminated sediment sites. The assessment of pollutant source tracking technologies will allow the Navy to accurately quantify Navy contaminant loads by identifying, reviewing, demonstrating, and validating contaminant source tracking technologies, which will provide a technical framework for Navy Remedial Project Managers (RPMs) and environmental managers. The development of a guidance document to detail and solve problems for Navy compliance with the Disinfectant/Disinfection Byproducts (D/DBP) rule and related issues. Continue developing containment and monitoring strategies for contaminated sediments. Develop an integrated software system that will allow for more exact location/identification of UXO in sediments, thereby eliminating excess costs of investigating/remediating non-UXO metal anomalies and further reduce safety risks to workers conducting the removals and long-term safety to subsequent users. Disinfection Byproducts Users Guide. Finalize the evaluating pollutant source tracking technologies and sediment transport users guide (A practical user's guide that provides RPMs with practical guidance on evaluating sediment transport at contaminated sediment sites to achieve successful, cost effective remedial decisions).

FY09: (U) Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Abiotic In Situ Treatment of 1,2,3-Trichloropropane to Protect Drinking Water Resources.

FY10: (U) . The Potable Water Quality Management Guidance Document which provides Navy drinking water program managers with the direction and information for meeting compliance goals contained in the new disinfection byproducts rules. Continue providing validated knowledge, models, processes and system to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Continue effort to establish guidelines and limitations for the Use of Biodiesel with Ground Tactical Vehicles. Maximize the use of biodiesel fuels in tactical vehicles and equipment. Demonstrate the practical application of Compound Specific Isotope Analysis (CSIA) associated with Monitored Natural Attenuation (MNA) to provide practical guidelines associated with its use and interpretation. Initiate efforts related to the regulatory requirements associated with climate change and associated emissions and reporting.

C. OTHER PROGRAM FUNDING SUMMARY:

(U) P-1 Procurement Line Item No. & Name. Not Applicable.

(U) C-1 MILCON Project No. & Name. Not Applicable.

(U) RELATED RDT&E: This project transitions shoreside pollution abatement technologies from two Navy Science and Technology programs and the Strategic Environmental Research and Development Program (SERDP). Project funding is leveraged by transitioning technologies to the Environmental Security Technology Certification Program (ESTCP) for final certification and by providing funding for Navy participation in ESTCP projects. Execution of this project is coordinated with related Marine Corps, Army, Air Force and NASA programs through direct coordination and active participation in the Joint Group for Pollution Prevention (JG-PP).

(U) PE 0602233N, Readiness, Training, and Environmental Quality Technology Development

(U) PE 0603716D, Strategic Environmental Research & Development Program (SERDP)

(U) PE 0603851D, Environmental Security Technology Certification Program (ESTCP)

D. ACQUISITION STRATEGY:

(U) This project is categorized as Non-ACAT (Non Acquisition). The project delivers a broad spectrum of products that require a variety of acquisition processes to implement. Equipment products for Naval stations and other mission funded activities costing over $100K are often procured centrally through the Navy Pollution Prevention Equipment Program (PPEP) or directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over $100K are procured through their Capital Purchases Program (CPP). For both types of activities, equipment products costing less than $100K, and process changes not requiring the purchase of new equipment such as consumable material or product substitutions, are funded through the activity's operating budgets. Occasionally there is a technology that must be implemented as a specialized facility. These are acquired through the Military Construction (MCON) Program. All these acquisition processes are pursued using a common strategy that satisfies the needs of all the critical stakeholders: 1) Fleet end user; 2) Funding sponsor for the Navy end user; 3) Other stakeholders with cognizance over the Navy process or operation being changed; 4) Cognizant environmental federal, state, and local regulators; and 5) The private or government organization that will produce the product.

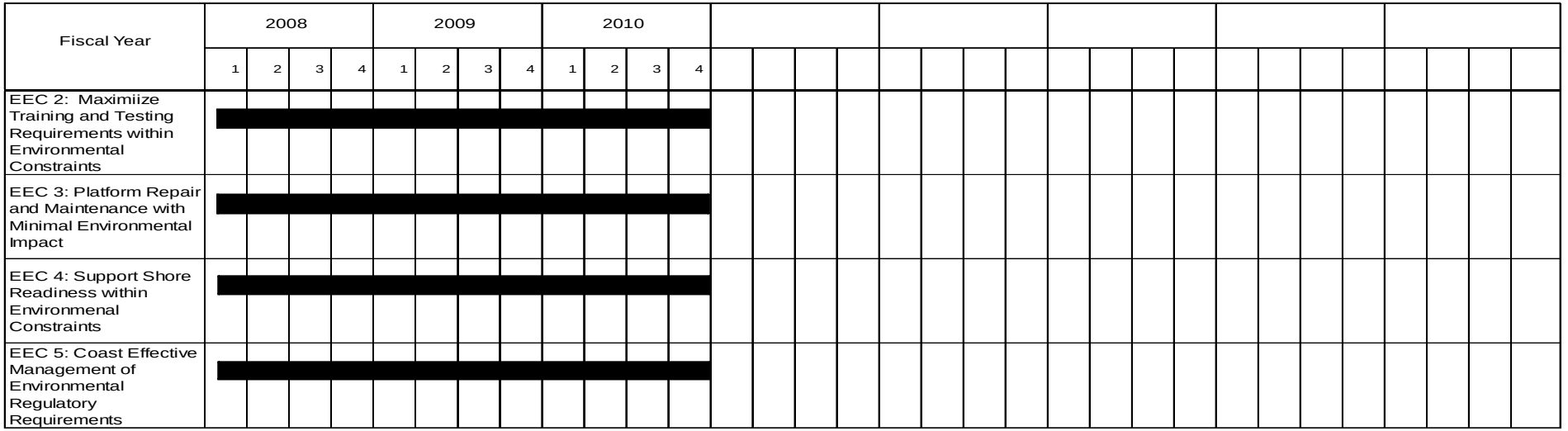
E. MAJOR PERFORMERS:

(U) Performing Activities: Naval Surface Warfare Center, Carderock Division (NSWC/CD), Naval Facilities Engineering Service Center (NFESC), Naval Surface Warfare Center, Indian Head Division (NSWC/IH), Space and Warfare Systems Center, San Diego (SSC/SC).

(U) Award Dates: About 55% of the project is executed via contracts awarded by the performing activities.

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **0817/Pollution Abatement**					
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
EEC 2	WR/PO	NFESC	5.316	0.835	VAR	0.718	VAR			
EEC 2	WR/PO	SSC/SD	2.607	1.460	VAR	1.378	VAR			
EEC 2	WR/PO	NSWC/IH	15.666	0.000		0.000				
EEC 3	WR/PO	NFESC	14.659	0.512	VAR	0.420	VAR			
EEC 3	WR/PO	NSWC/CD	7.694	0.720	VAR	0.250	VAR			
EEC 3	WR/PO	NAWC PAX	3.951	1.223	VAR	0.124	VAR			
EEC 4	WR/PO	NFESC	21.872	2.160	VAR	1.622	VAR			
EEC 4	WR/PO	NSWC/CD	0.200	0.344	VAR	0.488	VAR			
EEC 4	WR/PO	SSC/SD	0.520	0.400	VAR	0.340	VAR			
EEC 5	WR/PO	NFESC	4.497	0.286	VAR	0.183	VAR			
EEC 5	WR/PO	NSWC/CD	0.215	0.000		0.000				
EEC 5	WR/PO	NAWC PAX	0.223	0.000		0.000				
EEC 5	WR/PO	SSC/SD	4.673	0.439	VAR	0.238	VAR			
Subtotal Product Development			**82.093**	**8.379**		**5.761**				
Remarks:										
Total Cost			**82.093**	**8.379**		**5.761**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **0817/Pollution Abatement**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **0817/Pollution Abatement**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
EEC 2: Maximize training and Testing Requirements within Environmental Constraint	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
EEC 3: Platform Repair and Maintenance with Minimal Environmental Impact	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
EEC 4: Support Shore Readiness within Environmental Constraints	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
EEC 5: Coast Effective Management of Environmental Regulatory Requirements	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**				PROJECT NUMBER AND NAME **9204/Marine Mammal Research**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	6.097	4.367	8.850				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) The Navy has been and will continue to be subject to litigation with regard to the potential injuring and killing of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable marine mammal habitats, migration routes, or breeding areas, the possibility exists that such incidents are likely to continue in the future. The increasing public interest and pressure has resulted in escalating Fleet costs. For example, Fleet and SYSCOM development activities have been interrupted, modified, or altogether cancelled and environmental regulations have, among other things, required new ship construction shock trials to obtain Federal permits and conduct extensive environmental planning that can take several years to complete. The incorporation of mitigation measures in Fleet training operations to minimize the potential adverse effects on protected marine animals can significantly reduce the realism of these operations. In addition, the testing, evaluation, and deployment of new sonar detection and monitoring systems that use active acoustics are under intense public scrutiny for their potential adverse effects on whales and other marine mammals. Navy needs scientific evidence to substantiate its claims of limited or inconsequential adverse effects to marine life from operations.

(U) This program primarily focuses on the development of planning, monitoring, and mitigating tools to aid the Fleet in minimizing contact with and the potential harassment of protected marine animals during operations, exercises, training, and undersea surveillance and weapons testing. These new capabilities will encompass historical and newly acquired data and analytical models that together can predict marine animal habitats (where they are likely to be) and their natural and expected behavior (diving patterns, prey localization, calling activity, etc.).

(U) Accurate and timely monitoring and predicting the movement of whales and other protected marine animals plus an enhanced knowledge of how marine animals may react to Fleet activities (e.g., physiological and behavioral effects) will reduce Navy interaction with these animals; minimize the risk that legally-imposed monitoring and avoidance measures will adversely affect Fleet operations and exercises; minimize the substantial costs associated with operations, exercises, and tests that have to be modified or curtailed as a result of concerns about protected marine animals; and will reduce the likelihood of litigation related to actual or anticipated compliance problems with protected animals.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **9204/Marine Mammal Research**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Marine Mammal Location, Abundance and Movement	2.118	1.218	1.236
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.
FY09: (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.
FY10: (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.

	FY 2008	FY 2009	FY 2010
Navy Marine Mammal Program Plus-Up	0.894	0.000	0.000
RDT&E Articles Quantity	0	0	0

FY08: (U) Funds provided to SPAWAR San Diego to work with Hubbs SeaWorld Research Institute to support the intent of a FY07 Congressional Add related to the Navy Marine Mammal Program.

	FY 2008	FY 2009	FY 2010
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1.215	1.251	2.797
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.
FY09: (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.
FY10: (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **9204/Marine Mammal Research**

	FY 2008	FY 2009	FY 2010
Mitigation Methodologies: Monitoring, New Technology, and Risk Assess	1.820	1.838	2.247
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

FY09: (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

FY10: (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

	FY 2008	FY 2009	FY 2010
Acoustic Source Propagation	0.050	0.060	0.070
RDT&E Articles Quantity	0	0	0

FY08: (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.
FY09: (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.
FY10: (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.

	FY 2008	FY 2009	FY 2010
Living Marine Mammal Resources Research Center (LMRRC)	0.000	0.000	2.500
RDT&E Articles Quantity	0	0	0

FY10: (U) The Living Marine Mammal Resources Research Center (LMRRC) will establish, maintain, and manage a cooperative research program comprised of science and technology (S&T) and research, development, testing, and evaluation (RDT&E) projects; product development; technology transfer; and alliances with academia and the commercial sector to foster the advancement in understanding and conserving living marine resources. This program will help preserve and protect current and future undersea warfighting capabilities.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **9204/Marine Mammal Research**

C. OTHER PROGRAM FUNDING SUMMARY:

(U) Related RDT&E: (PE 0601153N / PE 0602435N / PE 0602782N / PE 0603235N)

(U) Related RDT&E: Strategic Environmental Research & Development Program (SERDP)

(U) Related RDT&E: National Oceanographic Partnership Program (NOPP)

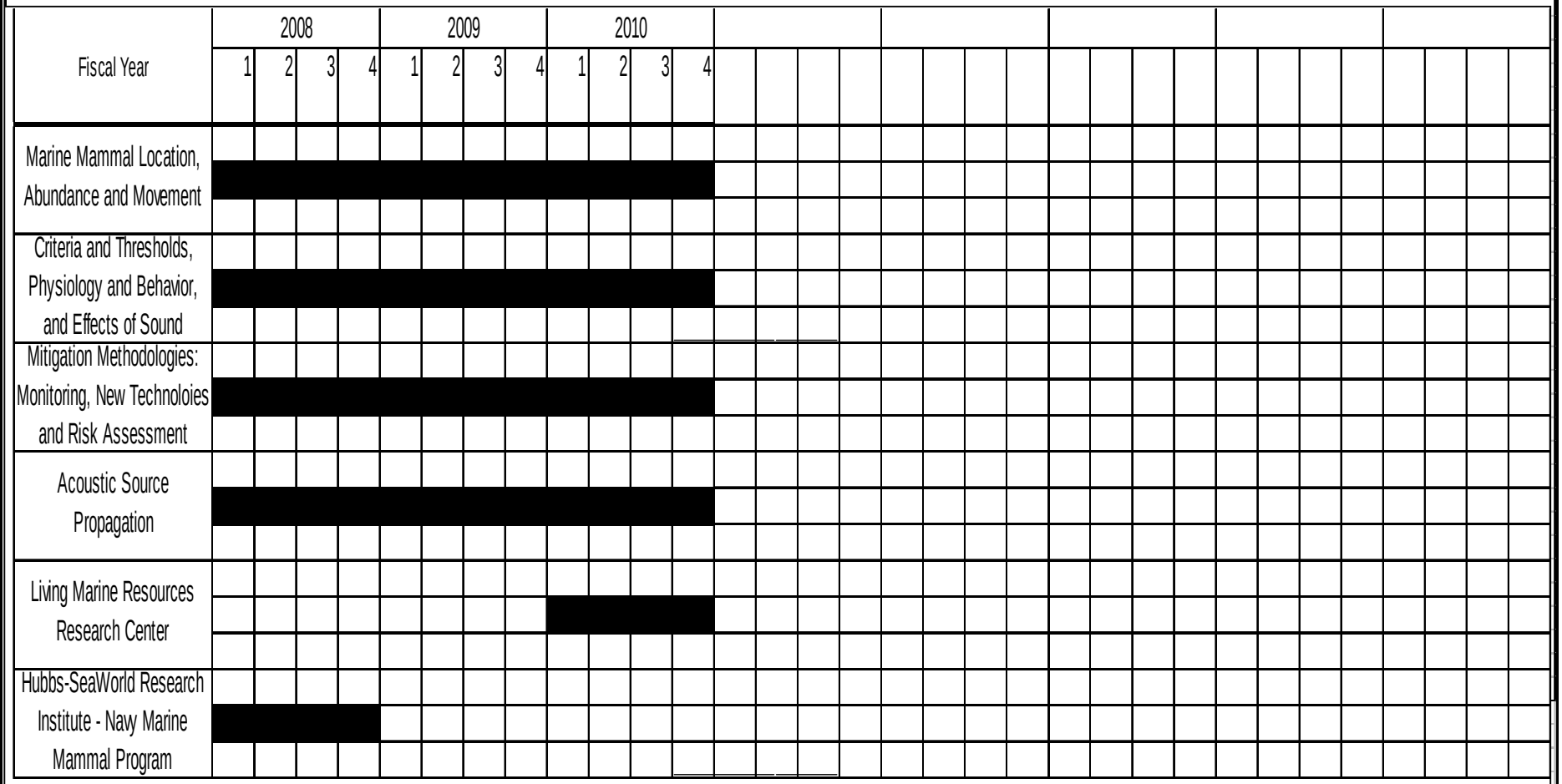
D. ACQUISITION STRATEGY:

(U) RDT&E Contracts are Competitive Procurements.

E. MAJOR PERFORMERS:

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **9204/Marine Mammal Research**					
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
Subtotal Management Services			**0.000**	**0.000**		**0.000**				
Remarks:										
Developmental Test & Evaluation	WR	NUWC	2.163	0.989	VAR	0.000				
Developmental Test & Evaluation	CPFF	University of Maryland	0.680	0.000		0.000				
Developmental Test & Evaluation	WR	NPGS, Monterey, CA	1.375	0.460	VAR	0.000				
Developmental Test & Evaluation	MIPR	NOAA, Fish Science Center	0.990	0.200	VAR	0.000				
Developmental Test & Evaluation	CPFF	Misc Contracts	0.533	0.000		0.000				
Developmental Test & Evaluation	CPFF	Scripps Institute	5.142	0.450	VAR	0.000				
Developmental Test & Evaluation	CPFF	U of Wash, APL	0.650	0.000		0.000				
Developmental Test & Evaluation	CPFF	Duke Univ.	0.425	0.000		0.000				
Developmental Test & Evaluation	CPFF	Oregon State Univ.	0.745	0.100	VAR	0.000				
Developmental Test & Evaluation	CPFF	Woods Hole Oceanographic Inst	0.171	0.940	VAR	0.000				
Developmental Test & Evaluation	WR	SPAWARSYSCEN SD CA	1.332	0.000		0.000				
Developmental Test & Evaluation	WR	NSWCCD Bethesda	0.290	0.000		0.000				
Developmental Test & Evaluation	WR	NRL	0.140	0.000		0.000				
Developmental Test & Evaluation	WR	NATO URC	0.091	0.328	VAR	0.000				
Developmental Test & Evaluation	CPFF	Marine Acoustics, Inc.	1.000	0.000		0.000				
Developmental Test & Evaluation	CPFF	San Diego State Univ	0.350	0.350	VAR	0.000				
Developmental Test & Evaluation	CPFF	ONR	0.030	0.000		0.000				
Developmental Test & Evaluation	WR	NMSA	0.582	0.550	VAR	0.000				
Developmental Test & Evaluation	CPFF	SPAWARSYSCEN SD LMRRC	0.000	0.000		8.850	TBD			
Subtotal Test & Evaluation			**16.689**	**4.367**		**8.850**				
Remarks:										
Total Cost			**16.689**	**4.367**		**8.850**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **9204/Marine Mammal Research**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**			PROJECT NUMBER AND NAME **9204/Marine Mammal Research**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Marine Mammal Location, Abundance, and Movement	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Acoustic Source Propagation	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4				
Living Marine Resources Research Center			Q1 Q2 Q3 Q4				
Hubbs-SeaWorld Research Institute - Navy Marine Mammal Program	Q1 Q2 Q3 Q4						

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603721N/ENVIRONMENTAL PROTECTION**	PROJECT NUMBER AND NAME **9999/Congressional Add**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010	
9536C Anoxia Research	1.157	1.198	0.000	
RDT&E Articles Quantity	0	0	0	

(U) This Congressional Add is a continuation of a FY 2007 Congressional Add. This effort will involve the monitoring of the oxygen content of the water in Hood Canal and streams throughout the watershed and will increase understanding of the long-term effects of low-oxygen levels on sealife. The monitoring information will be used to develop a mathematical model of Hood Canal. The model will be used to evaluate the effect of different potential sources of input to Hood Canal that might account for an existing anoxic condition.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**					R-1 ITEM NOMENCLATURE **0603724N, Navy Energy Program**			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**5.968**	**10.263**	**8.476**					
0829 / ENERGY CONSERVATION (ADV)	**3.622**	**3.866**	**3.960**					
0838/ Navy Mobility Fuels (ADV)	**1.574**	**1.709**	**4.516**					
9999 / CONGRESSIONAL ADDS	**0.772**	**4.688**						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports projects to evaluate, adapt, and demonstrate energy related technologies for Navy aircraft and ship operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) reduce energy costs; (c) apply energy technologies that improve environmental compliance; (d) relax restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels when military specification fuels are unavailable or in short supply; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. This program supports the achievement of legislated, White House, Department of Defense, and navy energy management goals. It also responds to direction from the Office of the Secretary of Defense, the Secretary of the Navy, and the Chief of Naval Operations to make up-front investment in technologies that reduce future cost of operation and ownership of the fleet and supporting infrastructure.

(U) Project 0829: Energy Conservation: The Fleet Readiness R&D Program is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. This Fleet driven program, managed through NAVSEA 05N, will identify mature potential energy saving and maintenance improvement areas, by involvement with Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEO, and the TMA/TMI community.

(U) Project 0838: Navy Mobility Fuels: This project provides data through laboratory, component, engine and fuel system tests which relate the effects of changes in Navy fuel procurement specification properties and chemistries to the performance and reliability of Naval ship and aircraft engine and fuel systems. This information is required to: (a) develop, validate and execute the test protocols necessary to approve fuels derived from non-petroleum feedstocks ; (b) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; (c) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military specification fuels are unavailable or in short supply; (d) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in fuel supply industry and (e) improve the capability to provide fuel quality surveillance in the field. Continued volatility and rapid escalation of the cost of fuel has placed additional pressures on the Navy budgets responsible for maintaining and sustaining the Navy tactical fleet both now and in the future. These pressures have placed an added emphasis on the potential utilization of lower cost commercial fuels and/or fuels derived from non-petroleum sources as a potential means of stabilizing the current and anticipated price volatility. Recent problems with petroleum based fuel quality have demonstrated the adverse affects fuel related problems can have on ship and aircraft system performance, reliability and readiness. While the impacts on readiness, additional maintenance costs, and the cost of lost equipment are often difficult to fully quantify they are often many times the cost of this program. This potential risk of fuel related problems over the next decade, given the unknowns of supply , feedstocks, environmental regulations and the introduction of new theaters of operation will continue to increase.
This project represents the only investment designed to maintain the Navy's ability to operate as a "smart" customer for fuels that cost over $4.0 B per year for procurement, transport, storage and consuming and are essential to fleet operations.

(U) Project 9999: Congressional adds

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY /	**BA-4**	0603724N, Navy Energy Program

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Presidents Budget 2009	6.020	5.611	5.840
Presidents Budget 2010	5.968	10.263	8.476
Total Adjustments	-0.052	4.652	2.636

Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		4.664	
SBIR/STTR/FTT Assessments	-0.044		
Program Adjustments			2.658
Rate/Misc Adjustments	-0.008	-0.012	-0.022
Subtotal	-0.052	4.652	2.636

Schedule:

Not Applicable

Technical:

Not Applicable.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E Project Justification					DATE **May 2009**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 4**	PROGRAM ELEMENT NUMBER AND NAME 0603724N/NAVY ENERGY PROGRAM				PROJECT NUMBER AND NAME 0829/ENERGY CONSERVATION (ADV)		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	3.622	3.866	3.960				
RDT&E Articles Qty	0	0	0				

ESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Fleet Readiness R&D Program is designed to develop and implement energy and maintenance saving improvements into existing Fleet assets. This Fleet driven program, managed through NAVSEA 05Z, will identify mature potential energy saving and maintenance improvement areas, by involvement with Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), PEO, and the TMA/TMI community. Potential technology target areas will include: Hull Hydrodynamics, Hull Husbandry, Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management, Propulsion Systems, Electrical Systems, and Power Generation and Storage systems. The program directly supports Fleet requirements to reduce energy consumption and lower maintenance costs. The program will focus on research and development across the following major areas:

(U) Hull Hydrodynamic Project(s) - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements.

(U) Hull Husbandry Project(s) - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both landbased and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency.

(U) HVAC Projects (s) - Project funds will be utitized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements.

(U) Thermal Management Project(s) - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC.

(U) Propulsion Systems Project(s) - Project funds will be utilized to indentify, perform landbased and ship board testing of ship propulsion system improvements, on Gas Turbine and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. (SCD# 1801 - Online Waterwash System for GTM/GTG, SCD# 1808 Power Convervation Management)

(U) Electrical Systems Project(s) - Project funds will be utilized to indentify requirements and perform landbased and ship board testing of ship electrical system improvements, to reduce overall fuel consumption and lower maintenance costs. (SCD# 1817 Variable Speed Drive VSD) for 1000 Gal. Firemain System, (SCD# 1818 VSD-IMP for 2000 Gal. Firepumps)

(U) Power Generation & Storage System Project(s) - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603724N/NAVY ENERGY PROGRAM**	PROJECT NUMBER AND NAME **0829/ENERGY CONSERVATION (ADV)**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.934	0.975	1.007
RDT&E Articles Quantity	0	0	0

(U) Hull Hydrodynamic Project(s) - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.387	0.392	0.423
RDT&E Articles Quantity	0	0	0

(U) Hull Husbandry Project(s) - Project funds will be utilized to identify and evaluate new underwater hull coating systems and underwater hull cleaning and maintenance techniques both landbased and shipboard to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.151	0.191	0.186
RDT&E Articles Quantity	0	0	0

(U) HVAC Projects (s) - Project funds will be utitized to accomplish prototype development, land and shipboard testing to determine overall mission and cost effectiveness of these improvements.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.188	0.191	0.200
RDT&E Articles Quantity	0	0	0

(U) Thermal Management Project(s) - Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation and reduce the overall need for HVAC.

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.119	1.172	1.166
RDT&E Articles Quantity	0	0	0

(U) Propulsion Systems Project(s) - Projects funds will be utilized to indentify, perform landbased and ship board testing of ship propulsion system improvements, on Gas Turbine and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. (SCD# 1801 - Online Waterwash System for GTM/GTG, SCD# 1808 Power Conservation Management)

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.655	0.753	0.776
RDT&E Articles Quantity	0	0	0

(U) Electrical Systems Project(s) - Projects funds will be utilized to indentify, perform landbased and ship board testing of ship electrical system improvements, to reduce overall fuel consumption and lower maintenance costs. (SCD# 1817 Variable Speed Drive VSD) for 1000 Gal. Firemain System, (SCD# 1818 VSD-IMP for 2000 Gal. Firepumps)

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603724N/NAVY ENERGY PROGRAM**	PROJECT NUMBER AND NAME **0829/ENERGY CONSERVATION (ADV)**

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.188	0.192	0.202
RDT&E Articles Quantity	0	0	0

(U) Power Generation & Storage System Project(s) - This project area will accomplish prototype development, laboratory and Fleet testing to determine overall mission and cost effectiveness of these improvements.

C. OTHER PROGRAM FUNDING SUMMARY:

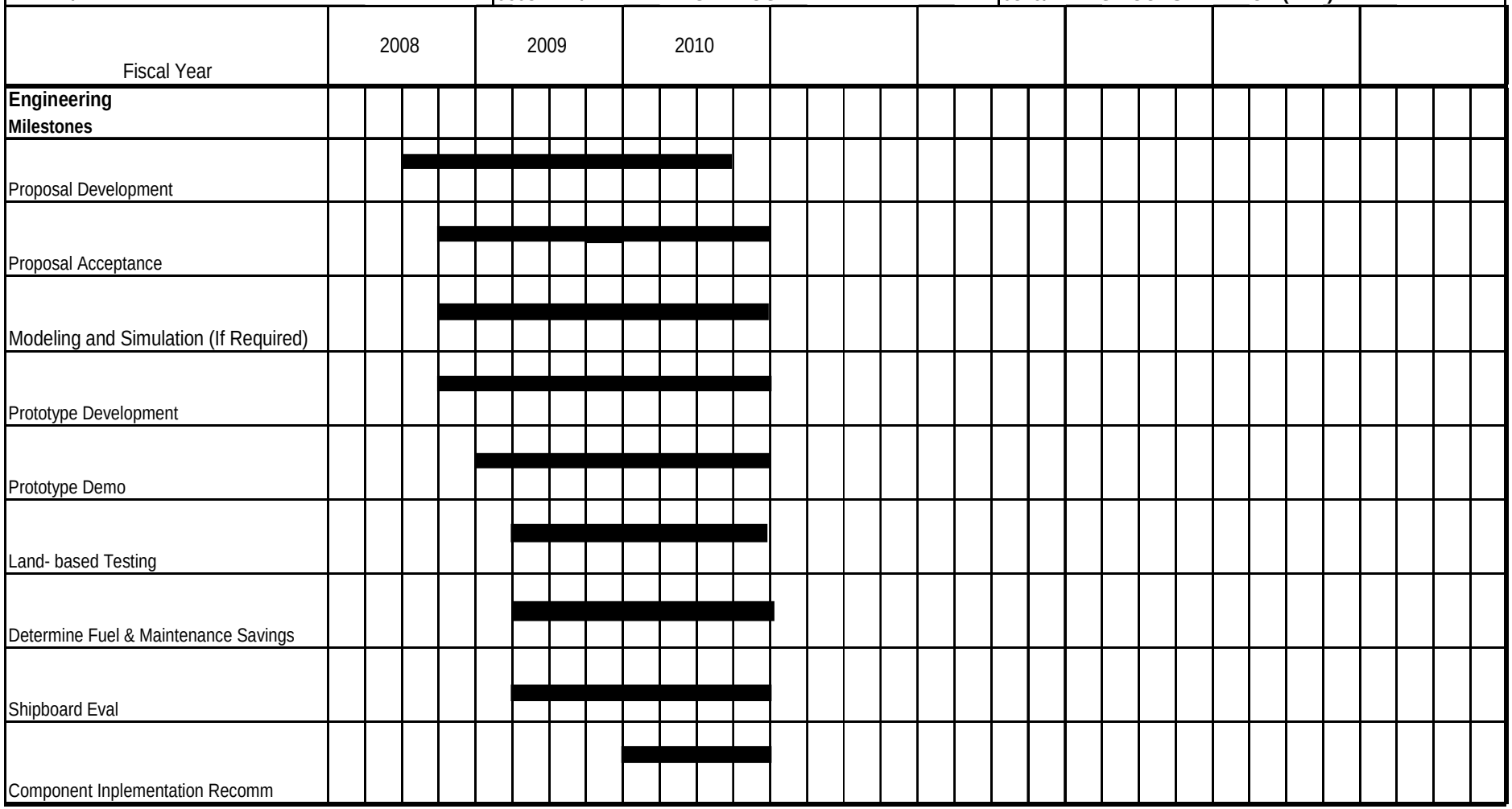
Line Item No. and Name	FY 2008	FY 2009	FY 2010
N/A			

D. ACQUISITION STRATEGY:

This is a non acquisition program that develops, evaluates, and validates mature technologies in support of Fleet fuel and maintenance savings.

CLASSIFICATION:	UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603724N/NAVY ENERGY PROGRAM**			PROJECT NUMBER AND NAME **0829/ENERGY CONSERVATION (ADV)**				
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		
Primary Hardware Development	WR	NSWC, Carderock/Bethesda, MD	0.374	0.387	VAR	0.399	VAR		
Systems Engineering	WR	NSWC, Carderock/Bethesda, MD	0.374	0.382	VAR	0.403	VAR		
Engineering Development	WR	NSWC, Carderock/Bethesda, MD	0.671	0.77	VAR	0.757	VAR		
Demonstration & Evaluation	WR	NSWC, Carderock/Bethesda, MD	0.709	0.763	VAR	0.786	VAR		
Subtotal Product Development			**2.128**	**2.302**		**2.345**			
Remarks:									
Subtotal Support Costs			**0.000**	**0.000**		**0.000**			
Remarks:									
Developmental Test & Evaluation	WR	NSWC, Carderock/Bethesda, MD	0.747	0.783	VAR	0.801	VAR		
Operational Test & Evaluation	WR	NSWC, Carderock/Bethesda, MD	0.187	0.195	VAR	0.201	VAR		
Live Fire Test & Evaluation	WR	NSWC, Carderock/Bethesda, MD	0.187	0.195	VAR	0.210	VAR		
Subtotal Test and Evaluation			**1.121**	**1.173**		**1.212**			
Remarks:									
Program Management Support	WR	NSWC, Carderock/Bethesda, MD	0.261	0.275	VAR	0.283	VAR		
Travel	ALLOT	NAVSEA/Washington, DC	0.037	0.039	VAR	0.041	VAR		
Test Assets	WR	NSWC, Carderock/Bethesda, MD	0.075	0.077	VAR	0.079	VAR		
Subtotal Management Services			**0.373**	**0.391**		**0.403**			
Remarks:									
Total Cost			**3.622**	**3.866**		**3.960**			

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603724N/NAVY ENERGY PROGRAM**	PROJECT NUMBER AND NAME **0829/ENERGY CONSERVATION (ADV)**



CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4a, SCHEDULE DETAIL			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603724N/NAVY ENERGY PROGRAM**		PROJECT NUMBER AND NAME **0829/ENERGY CONSERVATION (ADV)**

Schedule Profile	FY 2008	FY 2009	FY 2010
PROPOSAL DEVELOPMENT	3Q-4Q	1Q-3Q	1Q-3Q
PROPOSAL ACCEPTANCE	4Q	1Q-4Q	1Q-4Q
MODELING AND SIMULATION	4Q	1Q-4Q	1Q-4Q
PROTOTYPE DEVELOPMENT	4Q	1Q-4Q	1Q-4Q
PROTOTYPE DEMONSTRATION		1Q-4Q	1Q-4Q
LAND-BASED TESTING		2Q-4Q	1Q-4Q
DETERMINE FUEL & MAINTENANCE SAVINGS		2Q-4Q	1Q-4Q
SHIPBOARD EVALUATION		2Q-4Q	1Q-4Q
COMPONENT IMPLEMENTATION RECOMMEND			1Q-4Q

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E Project Justification					DATE **May 2009**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA 4**	PROGRAM ELEMENT NUMBER AND NAME 0603724N/NAVY ENERGY PROGRAM				PROJECT NUMBER AND NAME 0829/ENERGY CONSERVATION (ADV)		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	1.574	1.709	4.516				
RDT&E Articles Qty	0	0	0				
ESCRIPTION AND BUDGET ITEM JUSTIFICATION:							

Aircraft Fuels
Perform development, test and evaluation work on Naval aircraft fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance and approval to fleet operators for the safe use of military aircraft that include new additives or are derived from non-petroleum sources ; c) make needed periodic changes to the fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry and d) improve fleet methods to ensure fuel quality.

Ship Fuels
Performs development, test and evaluation work on Naval ship propulsion fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military fuels are unavailable or in limited supply; and c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry including fuel derived from non-petroleum sources.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603724N, Navy Energy Program	0838, Mobility Fuels (ADV)

B. Accomplishments/Planned Program

Aircraft Fuels	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.765	0.869	2.257	
RDT&E Articles Quantity				

Aircraft Fuels
Perform development, test and evaluation work on Naval aircraft fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance and approval to fleet operators for the safe use of military aircraft that include new additives or are derived from non-petroleum sources ; c) make needed periodic changes to the fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry and d) improve fleet methods to ensure fuel quality.

FY 2008 Plans:
Continue development of an equipment/fuel qualification procedure to evaluate and approve alternative fuels. Continue development of shipboard-based sensors and instruments to rapidly determine critical jet fuel properties. Field trial Portable and benchtop fuel contamination detector.

FY 2009 Plans:
Continue development of equipment/fuel qualification protocol to evaluate and approve alternative fuels. Continue development and test prototype of multi-property shipboard-based sensors and instruments to rapidly determine critical jet fuel properties.

FY 2010 Plans: Complete development of Navy qualification protocol to evaluate and approve alternative fuels. Transition multi-property shipboard-based sensors and instruments to rapidly determine critical jet fuel properties. Initiate development dual compatible (ship and aircraft) lubricity improving additive.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603724N, Navy Energy Program	0838, Mobility Fuels (ADV)

B. Accomplishments/Planned Program (Cont.)

Ship Fuels	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.809	0.840	2.259	
RDT&E Articles Quantity				

Ship Fuels
Performs development, test and evaluation work on Naval ship propulsion fuels to: a) determine the extent to which unnecessarily restrictive specification features can be relaxed to reduce cost and increase availability worldwide; b) provide guidance to fleet operators for the safe use of off-specification or commercial grade fuels when military fuels are unavailable or in limited supply; and c) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry including fuel derived from non-petroleum sources.

FY 2008 Plans:
Complete feasibility study of specifying JP-5 as the Single Fuel At-Sea for use by all Naval Systems (ships, aircraft and ground equipment). Continue development of a qualification procedure to evaluate and approve utilization of synthetic and ultra-clean, low sulfur ship fuels. Continue development of shipboard-based sensors and instruments to rapidly determine critical ship fuel properties. Complete evaluation of impact of increased utilization of commercial specification fuels.

FY 2009 Plans:
Continue development of a qualification procedure to evaluate and approve utilization of synthetic and ultra-clean, low sulfur ship fuels. Complete development of shipboard-based sensors and instruments to rapidly determine critical ship fuel properties. Continue review of the F-76 ship distillate fuel specification and test requirements evaluation to remove any unnecessary requirements to increase availability.

FY2010 Plans: Continue development of Navy protocol to evaluate and approve alternative fuels. Test shipboard-based sensors to rapidly determine critical fuel properties. Initiate development dual compatible (ship and aircraft) lubricity improving additive.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0603724N, Navy Energy Program	0838, Mobility Fuels (ADV)	

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

Not Applicable

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)												DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603724N, Navy Energy Program			PROJECT NUMBER AND NAME 0838, Mobility Fuels (ADV)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					Target Value of Contract
Primary Hardware Development												
Ancillary Hardware Development												
Aircraft Integration												
Ship Integration												
Ship Suitability												
Systems Engineering	WX	NRL, WASHINGTON, DC	0.350			0.200	10/09					
Systems Engineering	WX	NAWCAD, PAX RIVER	3.000	0.800	10/08	0.800	10/09					
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			3.350	0.800		1.000						
Remarks:												
Development Support												
Software Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
Studies & Analyses												
GFE												
Award Fees												
Subtotal Support			0.000	0.000		0.000						
Remarks:												

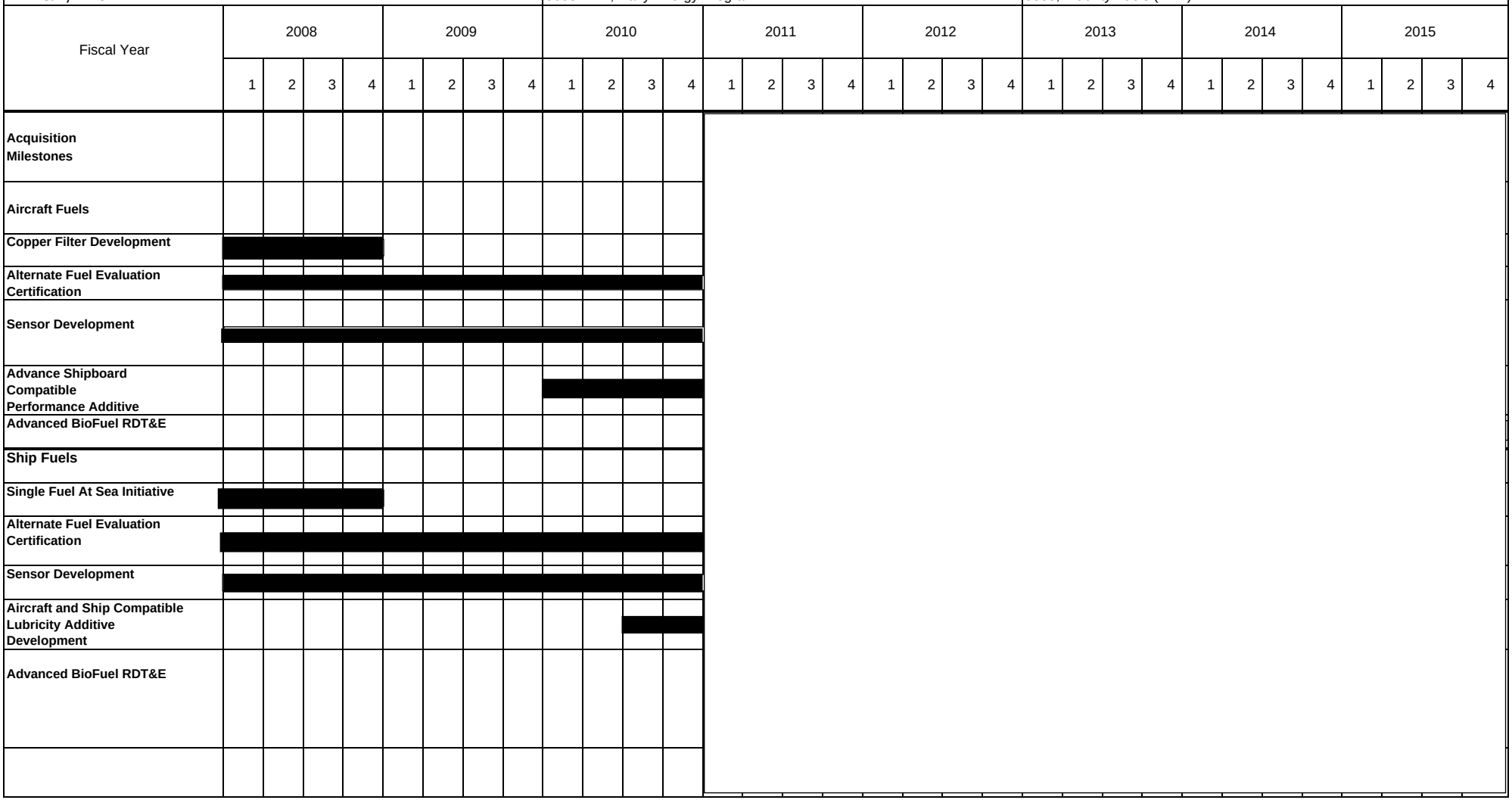
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603724N, Navy Energy Program			PROJECT NUMBER AND NAME 0838, Mobility Fuels (ADV)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	Various	Various	2.447	0.078	Various	1.894	Various					
Developmental Test & Evaluation	MIPR	Army Tank & Armaments Warren, MN	0.228									
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			2.675	0.078		1.894						
Contractor Engineering Support												
Program Management Support	Various	Various	2.420	0.831	Various	1.622	Various					
Program Management Support	MIPR	Southwest Res Instit., San Antonio, TX	0.696									
Travel												
Transportation												
SBIR Assessment												
Subtotal Management			3.116	0.831		1.622						
Total Cost			9.141	1.709		4.516						

EXHIBIT R4, Schedule Profile

DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603724N, Navy Energy Program	0838, Mobility Fuels (ADV)



CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 4**	PROGRAM ELEMENT 0603724N, Navy Energy Program				PROJECT NUMBER AND NAME 0838, Mobility Fuels (ADV)			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Aircraft Fuels								
Copper Removing Filter Development	1Q-4Q							
Alternate Fuel Evaluation/Certification	1Q-4Q	1Q-4Q	1Q-4Q					
Sensor Development	1Q-4Q	1Q-4Q	1Q-4Q					
Advance Shipboard Compatible Performance Additive			1Q-4Q					
Advanced BioFuel RDT&E								
Ship Fuels								
Single Fuel At Sea Initiative	1Q-4Q							
Alternate Fuel Evaluation/Certification	1Q-4Q	1Q-4Q	1Q-4Q					
Sensor Development	1Q-4Q	1Q-4Q	1Q-4Q					
Aircraft and Ship Compatible Lubricity Additive Development			3Q-4Q					
Advanced BioFuel RDT&E								

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification							DATE: **MAY 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603724N/NAVY ENERGY PROGRAM				PROJECT NUMBER AND NAME 9999 CONGRESSIONAL ADDS			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Project Cost	**0.772**	**4.688**						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Congressional Add:
Hydrogen Fuel Cell Development
Ocean Thermal Energy
The Molten Carbonate Fuel Cell Demonstration

CLASSIFICATION: UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification			DATE: **MAY 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0603724N/NAVY ENERGY PROGRAM	9999 CONGRESSIONAL ADDS	

B. Accomplishments/Planned Program

Hydrogen Fuel Cell Development	FY 08	FY 09		
Accomplishments/Effort/Subtotal Cost		1.197		
RDT&E Articles Quantity				

The Hydrogen Fuel Cell Development project will transfer a microfiber fuel cell technology's manufacturing process from a research and development level to a manufacturing environment and evaluate various parameters including production speed and product quality. Development and scale up of extrustion process to verify high speed production capability. Optimization of current Unicell production processes to meet manufacturing level production of extrusion process. Optimization and scale-up of fuel cell system production processes.

The Molten Carbonate Fuel Cell Dem	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		3.491		
RDT&E Articles Quantity				

The Molten Carbonate Fuel Cell Demo. is a turn-key project is to test and evaluate the operation and performance of a molten carbonate fuel cell (MCFC) power system integrated with the XX system at Submarine Base, located at Groton, CT to provide base load power. The key performance objective of the proposed program is to manufacture, install, commission, operate and maintain a 300 kilowatt (KW) MCFC power system at Submarine Base, located at Groton, CT. Selected operational parameters will be monitored, recorded, analyzed, and reported over a time period of 36 months. The Government may exercise an option or options to increase the installed capacity to 1 megawatt (MW).

OCEAN THERMAL ENERGY	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.772			
RDT&E Articles Quantity				

Ocean Thermal Energy Conversion to produce liquid hydrocarbon fuels from sea water.

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: May 2009		
Appropriation/Budget Activity **RDT&E, N BA4**						R-1 Item Nomenclature: 0603725N / Facilities Improvement		
COST ($ in millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**9.175**	**18.832**	**4.002**					
0995 Naval Facilities System	**1.688**	**1.777**	**1.831**					
3155 Force Protection Ashore	**2.329**	**2.295**	**2.171**					
9999 Congressional Adds	**5.158**	**14.760**						

A. Mission Description and Budget Item Justification:

(U) This program provides for capabilities to a) overcome performance limitations and reduce the life cycle cost of shore facilities, and b) provide protection against terrorist attacks for shore installations and their operations. The program focuses on technical and operational issues of specific Navy interest, where there are no unbiased test validated Commercial Off the Shelf (COTS) solutions available, and where timely capabilities may not materialize without specific demonstration or validation by the Navy. Additionally, the program completes the development of technologies originating from Navy, DOD and other sources of Science and Technology programs, including the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) and Department of Energy (DOE). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization (FSRM) program, and Antiterrorism and Force Protection (ATFP) Other Procurement, Navy (OP,N) program. Project 0995 addresses the following Navy facilities requirements during FY 2008 through FY 2010: Advance Technology for Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Facilities Sustainment, Restoration and Modernization, and Modular Hybrid Pier for reducing the total ownership cost of future facilities and enable new planning options through relocatable waterfront facilities. This project is consistent with recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities." The Force Protection Ashore Project 3155, addresses selective topics in modeling; and material technologies to reduce the vulnerability of installations; and reduce the acquisition and operating costs of protective technologies. The demonstrations and validations provide the independent, technical and operational test data for the development of competitive performance specifications to acquire the required capabilities. The ATFP project is coordinated with other DOD programs.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
Appropriation/Budget Activity **RDT&E,N / BA4**	R-1 Item Nomenclature: 0603725N / Facilities Improvement

B. Program Change Summary:

Funding:	FY 2008	FY 2009	FY 2010
Presidents Budget 2009	9.363	4.086	4.057
Presidents Budget 2010	9.175	18.832	4.002
Total Adjustments	-0.188	14.746	-0.055
Summary of Adjustments			
SBIR Assessments	-0.188		
Congressional Adds		14.800	
Congressional Adjustments		-0.051	
Rate /MISC Adjustments		-0.003	-0.055
Subtotal	-0.188	14.746	-0.055

C. Other Program Funding Summary: Provided in R-2a.

D. Acquisition Strategy: Provided in R-2a.

E. Performance Metrics: Provided in R-4.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification					**DATE: May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement				PROJECT NUMBER AND NAME 0995 / Naval Facilities System			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
0995 / Naval Facilities System	**1.688**	**1.777**	**1.831**					

A. Mission Description and Budget Item Justification:

(U) This program provides the Navy with new engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available RDT&E resources on satisfying facility requirements where the Navy is a major stakeholder or where there are no test validated Commercial Off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy Science and Technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization Programs (FSRP). Project 0995 is addressing four Navy facilities requirements during the fiscal years FY 2008 through FY 2010: Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Facilities, Sustainment, Restoration and Modernization and Modular Hybrid Pier. The execution of this program is consistent with the findings and recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities."

(U) Waterfront Facilities Repair and Upgrade: About 75% of the Navy's waterfront facilities are over 45 years old. They were designed for a service life of 25 years and to satisfy the mission requirements existing at that time. The over aged reinforced concrete requires costly and repetitive repairs. In addition, to accomplish more pier side ship maintenance and thus reduce drydock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons when piers were originally designed for no concentrated loads. This sub-project addresses new materials and design methods to extend the service life of existing waterfront facilities by an additional 15 or more years, and conventional concrete patches and composite-enhanced repairs. Other initiatives include; new longer-lasting low-maintenance fendering systems that eliminate the need for the frequent replacement of timber piles and fenders ; a new Impulse Load Method (ILM) for accurately and quickly determining the vertical load capacity of piers and wharves; and a new Swinging Weight Deflectometer (SWD) technique to determine the lateral stability of piers for earthquake forces and docking ship's impact. Using this new technology at a cost of $1-2M for repairs and upgrades per pier will result in $50M in cost avoidance for demolition and replacement.

(U) Technologies To Reduce The Cost of Facilities, Sustainment, Restoration and Modernization (FSRM): SRM issues of high operational significance are addressed on a priority basis .The costs to correct these critical facility deficiencies are over $3.1B as reported in the FY 2000 Annual Inspection Summary (AIS). Current Navy FSRM funding levels are insufficient to prevent the continued growth of the backlog of mission and safety critical maintenance and repairs. This effort will demonstrate and validate the cost and reliability of advanced technologies in order to assure their acceptance and implementation in traditionally conservative public works and construction industries. The effort will accelerate the validation, commercialization, and wide-spread implementation of the facility technologies urgently required to reduce the cost of correcting the deficiencies in the Navy's FSRM backlog. Estimated returns on these investments are better than 60 to 1.

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	0995 / Naval Facilities System

A. Mission Description and Budget Item Justification (cont):

(U) MODULAR HYBRID PIER (MHP): Modular Hybrid Pier started in FY02 to achieve completions required by construction acquisition schedules. The Navy is faced with the necessity of recapitalizing a large portion of its waterfront infrastructure over the next several decades. The Modular Hybrid Pier initiative develops and validates innovative material and design technologies for a mission-flexible waterfront infrastructure characterized by significantly reduced total ownership cost and increased mission flexibility. The proceeding sub-project Waterfront Facilities Repair and Upgrade will enable the Navy to economically extend the useful service life of existing piers and wharves. While reducing the need for immediate replacement, eventual replacement will be required. This MHP sub-project provides improved technology for new piers. Emerging innovative structural and materials technologies, particularly those that will transition from the Navy's applied research and advanced development program, will provide enhanced-capability. Structures may have a comparable initial cost yet have far less maintenance and repair costs. Use of advanced materials and high performance lightweight concrete will produce structures that have twice the economic service life of the conventional piers. Modular design will enable off-site fabrication in pre-cast plants that will shorten the duration of construction and lower the cost relative to conventional on-site demolition followed by on site/on base construction. Plant fabrication will vastly improve quality and result in repair-free durability because of superior performance concrete with post-tensioning technologies. The modular concept will facilitate change-out of components for modifications to increase capacity to adapt to future ship designs. Mobility due to barge configuration will enable relocatability of structural platform modules through flotation is a significant new capability option which will save money and provides new military worth/planning and deployment options. An economic analysis has shown that a modular hybrid (deployable) pier will have a Net Present Value (NPV) cost that is $15M less over its service life than that for a conventional pier constructed of ordinary reinforced concrete. The MHP, partly because of following the sea levels will have superior operational benefits to ship/port operations. The knowledge from this pier project will enable other concrete facility options that are fabricated offsite and relocatable for adjustment to basing changes. The technology of concrete and reinforcement and corrosion proofing will have wide spread applicability to all concrete construction.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	0995 / Naval Facilities System

B. Accomplishments/Planned Program

	FY 08	FY 09	FY 10	
Waterfront Repair and Upgrade	0.000	0.100	0.298	

FY 09: Initiate validation testing and evaluation of Swinging Weight Deflectometer (new capability) method for determining the actual new or remaining strength of piers to resist lateral loads from berthing ships. Strength is "an" indication of durability.

FY10: Complete validation testing of Swinging Weight Deflectometer.

	FY 08	FY 09	FY 10	
Facilities, Sustainment, Restoration & Modernization	0.000	0.748	1.036	

FY 09: Complete testing (interim validation) of flexible (non-cracking) marking paint for bituminous airfield pavements. Continue testing and evaluation of pile encasement to extend life of concrete piles currently decomposing from effects of alkali silica reaction (ASR) / delayed entrengite formation. Initiate testing and evaluation of non-destructive methodology for certifying safe load capacity of bollards at heavy weather moorings Initiate data collection to evaluate performance of building envelopes of mission critical facilities to extreme weather events (Katrina, Ivan, Charley). Define materials, energy, and management issues with the maintenance of sustainable design.

FY10: Initiate field validation testing and performance monitoring of pavement installed in vertical take-off and landing (VTOL) pads for resistance to high temperature/erosion effects of engine exhausted of joint strike fighter (JSF), F-35B. [Transition from Enterprise and Platform Enabler (FNC-EPE), PE 0602236N]. Complete testing of ASR remediation technology and bollard NDE test system. Initiate validation testing of high return-on-investment facilities/materials technologies from ONR and other science and technology from universities and industry. Determine practicability of retrofitting sustainable engineering concepts to conventional facilities.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 0995 / Naval Facilities System

B. Accomplishments/Planned Program (cont.)

	FY 08	FY 09	FY 10	
Modular Hybrid Pier (MHP)	1.688	0.929	0.497	

FY 08: Complete dynamic tests to validate performance of full-scale HMP fender system to seismic and wind loads. Continue corrosion monitoring of MHP test bed. Continue simulation and modeling of MHP response to hurricane environmental loads and long period waves. Initiate design of prototype MHP to refine MHP geometry, to refine mooring system, to refine access ramp/bearings and to develop critical structural details that meet CNRSW and CNR MIDLANT ship berthing requirements and incorporate lessons-learned from validation testing, simulation and modeling.

FY09: Complete simulation and modeling of MHP hydrodynamic response. Complete design of full scale prototype MHP.

FY10: Develop plans for operational test of 1st MHP prototype. Apply MHP technology lessons to other - than - pier floating/relocatable facility options.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 0995 / Naval Facilities System

C. Other Program Funding Summary:

Line Item No. & Name	FY 2008	FY 2009	FY2010

P-1 Procurement Line Item No. & Name. Not applicable.
C-1 MILCON Project No. & Name. Not applicable.

(U) RELATED RDT&E:
This project transitions waterfront facilities technology from applied research and advanced development programs PE0602234N, Materials, Electronics and Computer Technology, PE0602236N, Warfighter Sustainment Applied Research, and PE0603236N, Warfighter Sustainment Advanced Technology. It also transitions facility technologies developed at universities under the sponsorship of the National Science Foundation (NSF), by the Building and Fire Research Laboratory (BRL) of the National Institute of Standards and Technology (NIST), and by the Construction Engineering Research Laboratories (CERL) and Waterways Experiment Station (WES) of the U. S. Army Engineer Research and Development Center (USAERDC) when they can contribute to the solution of one of the Navy requirements being addressed by this project. The project pursues opportunities to leverage private sector investment through partnerships with private sector organizations, such as the Civil Engineering Research Foundation (CERF), the Marketing Development Alliance (MDA) of Fiberglass Reinforced Plastics Composites Industry and the Strategic Development Council of the American Concrete Institute. The project seeks to leverage and collaborate with the Navy Sustainment, Restoration and efforts including Military Construction.

D. Acquisition Strategy:

(U) This project is categorized as Non-ACAT (Non Acquisition). The know-how produced from this project enables the safe and cost effective application of emerging/advanced technology concepts and products: 1) specifying or describing the performance, 2) enabling innovative design applications, 3) enabling quality control/quality assurance during constructions, 4) enabling reliability and maintainability during operations, and 5) developing lifecycle cost projections and environmental sustainability life cycle data for Navy policy guidance and criteria serving the Navy Facilities, Sustainment, Restoration and Modernization and Military Construction (MILCON) programs. The data from this program enables earliest and safe utilization of advanced technology for cost avoidance in the facilities infrastructure. The technical know-how of this program is transferred to the construction industrythat delivers Navy construction and maintenance through the inclusion of individual firms (using competitive selection processes) and industry organizations/associations in the development and testing activities. MILCON, Repair and Modernization are not serial production acquisition processes but site specific construction acquisitions by the construction industry that fundamentally differs from weapons serial production.

E. Major Performers:

Major performers include Naval Facilities Engineering Service Center, Port Hueneme, CA. , Berger/Abam Engineers, Federal Way, WA, and Marathon Construction, Lakeside, CA.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						**DATE: May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603725N / Facilities Improvement				PROJECT NUMBER AND NAME 0995 / Naval Facilities System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Waterfront Facilities Repair & Upgrade	WX	NFESC, Pt Hueneme, CA	1.760	0.100	10/08	0.298	10/09			Cont.	0.000	na
	WR	NUWC, New London, CT	0.687								0.000	
	WR	EFANW, Poulsbo, WA	0.012								0.000	
	FP	MCA Engrg, Costa Mesa, CA	0.045								0.000	
Facilities, Sustainment, Restoration	WX	NFESC, Pt Hueneme, CA	3.583	0.298	10/08	0.286	10/09			Cont.	0.000	na
and Modernization Tech	FP	CERF, Washington, DC	0.045								0.000	
	RC	LANTDIV, Norfolk, VA	0.051								0.000	
	FP	NAS Misawa, Misawa, Japan	0.028								0.000	
	WR	SWDIV, San Diego, CA	0.002								0.000	
	FP	Han Padron Inc., NY	0.019								0.000	
	FP	Atmos Anal. &Consult, Inc.	0.006								0.000	
	RC	N. State Univ. Aberdeen, MD	0.042								0.000	
	WR	PWD, NWS, Charleston, SC	0.081								0.000	
	FP	ADC, Inc.	0.021								0.000	
	FP	Weston Geophysical, MA	0.025								0.000	
	FP	Northwestern Univ., IL	0.024								0.000	
	FP	Blackledge Diving	0.010								0.000	
	FP	ABC Painting, CA	0.032								0.000	
	FP	Polyspec Corp, TX	0.060									
	FP	Abras. Blast & Coat, CA	0.030									
	MP	U. S. Army Huntsville, AL	0.100									
	RC	Contractors TBD	0.050	0.450	03/08	0.750	03/08					
Modular Hybrid Pier	WX	NFESC, Pt Hueneme, CA	3.393	0.679	10/08	0.497	10/08					
	WR	SWDIV, San Diego, CA	0.347									
	FP	BergerAbam. Seattle, WA	5.006	0.250	10/08							
	RC	Marathon Const., CA	2.207									
	RC	Texas A&M	0.173									
			17.839	1.777		1.831						
Remarks: Total Prior Years Cost summation does not include performing activities from projects completed in prior years.												
Development Support												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Award Fees												
Subtotal Support			0.000	0.000		0.000						
Remarks: Included in Product Development costs.												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						**DATE: May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 0995 / Naval Facilities System						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000						
Remarks: Not applicable.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000						
Remarks: Not applicable.												
Total Cost			17.839	1.777		1.831						
Remarks: Not applicable.												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile | **Date: May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4**

PROGRAM ELEMENT: 0603725N / Facilities Improvement

PROJECT NUMBER AND NAME: 0995 / Naval Facilities System

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MHP Acquisition Milestones								MS C																								
MHP Systems Test Bed																																
MHP System Development						PDR																										
Test & Evaluation Milestones	DT/OT																															
Development Test																																
Operational Test																																
Production Milestones									LRIP I Start																							
LRIP (1st MHP) FY 07																																
FRP FY 09																																
Deliveries																																

R-4 Schedule Profile

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				**DATE: May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 0995 / Naval Facilities System				
Schedule Profile (MHP)	FY 2008	FY 2009	FY 2010					
Milestone II (MSII)								
MHP Systems (Test Bed) Development								
Combined Developmental/Operational Testing (DT/OT)	1Q-4Q	1Q-4Q						
Preliminary Design Review (PDR)		2Q						
Milestone C (MS C)		4Q						
Start Low-Rate Initial Production I (LRIP)			1Q					

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification					**DATE: May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BS-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement				PROJECT NUMBER AND NAME 3155 Force Protection Ashore			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
3155 / Force Protection Ashore	**2.329**	**2.295**	**2.171**					

A. Mission Description and Budget Item Justification:

(U) Protection of the Navy Installations against terrorist activities requires development and deployment of advanced technology for force protection capabilities that are cost effective. Manpower costs of protection systems with today's technology are very high . Performance is not adequate to reduce vulnerability cost-effectively. This Antiterrorism and Force Protection Ashore Project will develop, demonstrate and validate technologies for the following: access control and perimeter denial; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency centers (including human and information support systems); construction integrated surveillance sensors and robotic systems for intruder detection; material systems to improve utilities security and recovery; and material concepts to reduce injury and death. Through demonstration and validation of risk modeling and simulation models, the potential of emerging technologies will be evaluated and installation security strategies that reduce manpower and other costs will be formulated. Installation protection concepts against attacks from the air will be identified and jointly demonstrated. These demonstrations and validations derive from advanced technology from science and technology programs of government academia and industry. The technology produces data for performance specifications for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement	3155 Force Protection Ashore

B. Accomplishments/Planned Program

	FY 08	FY 09	FY 10	
3155 / Force Protection Ashore	2.329	2.295	2.171	

FY 08: Continue developments and demonstrations of advanced concepts and prototypes for ATFP applications at Naval Installations.
- Demonstrate in four different terrains the capability to rapidly estimate (with available GIS data and without laborious ground surveys) perimeter sensor systems to specified security levels.
- Demonstrate for security certification and interoperability over the horizon wireless advanced technology.
- Develop employment concepts, test bed and test plan for demonstrating advanced sensors capable of seeing under inclement weather; to be transitioned in 09 from ONR's Future Navy Capabilities (FNC) Program.

FY 09: Continue and initiate advanced prototype development and demonstrations for ATFP applications at Naval Installations as follows.
- Complete and demonstrate (full scale) a multi-perimeter (both outer and inner) rapid estimating method/model for perimeter security to installations.
- Develop and demonstrate advanced prototypes of inclement weather sensors for detecting intruders; transitioned from ONR Future Navy Capabilities (FNC) program.
- Develop advanced prototypes and test Intelligent Video technology for waterfront and on-land security applications --- transitioned from ONR Future Navy Capabilities (FNC) program.
- Develop advanced prototypes of low frequency continuous wave system to warn and stop (i.e. neutralize) intruding diver/swimmers approaching Navy piers and ships (transitioned from ONR S&T)

FY10: Continue, complete and initiate advanced prototype development and demonstration for ATFP applications at Naval installations as follows:
- Continue the development of inclement weather mid range IR sensors for detecting intruders at installation perimeter.
- Continue development, demonstration and integration of intelligent video in security systems.
- Initiate demonstration of low frequency continuous wave sensors to warn and stop intruding malevolent divers and swimmers approaching Navy piers and ships.
- Develop prototype floating barrier to protect ships against swarms of attacking boats.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 3155 Force Protection Ashore

C. Other Program Funding Summary:

Line Item No. & Name	FY 2008	FY 2009	FY 2010	To Complete	Total Cost
P-1 Procurement Line item No., Name:					
812800 Physical Security Equipment	53.941	56.839	38.086	Con't	Con't
C-1 MILCON Project No. & Name. Not applicable.					
(U) RELATED RDT&E:					

D. Acquisition Strategy: Not applicable.

Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.

E. Major Performers:

Naval Facilities Engineering Service Center (NFESC), Port Hueneme, CA
Naval Surface Warfare Center (NSWC-DL), Dahlgren, VA
Naval Surface Warfare Center (NSWC) Panama City, FL
Operational Test and Evaluation Force
SPAWAR System Center, San Diego, CA
Naval Surface Warfare Center, Crane, IN

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						**DATE: May 2009**							
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 Force Protection Ashore							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Force Protection Ashore	WR	NFESC, Port Hueneme, CA	0.729	0.500	10/08	0.881	TBD					
Force Protection Ashore	WR	NSWC Dahlgren, Panama City, Crane	1.600	1.200	03/09	0.990	TBD					
Force Protection Ashore	WR	SSC San Diego, CA	0.000	0.595	03/09							
Force Protection Ashore	WR	OPTEVFOR, VA	0.000	0.000		0.300						
			2.329	2.295		2.171						
Development Support												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Award Fees												
Subtotal Support			0.000	0.000		0.000						
Remarks: Included in Product Development costs.												

(Exhibit R-3, page 1 of 2)

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)					**DATE: May 2009**							
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 Force Protection Ashore							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	NA											
Operational Test & Evaluation												
Live Fire Test & Evaluation												
Test Assets												
Tooling												
GFE												
Award Fees												
Subtotal T&E			0.000	0.000		0.000						
Remarks: Not applicable.												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Labor (Research Personnel)												
SBIR Assessment												
Subtotal Management			0.000	0.000		0.000						
Remarks: Not applicable.												
Total Cost			2.329	2.295		2.171						
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile													**DATE: May 2009**																			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**							PROGRAM ELEMENT 0603725N / Facilities Improvement						PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Perimeter Estimating Model/Method																			
Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Assessment																																
Concept of Employment																																
System Development Spiral 1 Development Spiral 2 Development			△																													
Test & Evaluation Milestones Development Test Operational Test				△		△																										
Production Milestones Procurement Specification																																
Deliveries																																

R-4 Schedule Profile

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																																				
DATE: May 2009																																					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**									PROGRAM ELEMENT 0603725N / Facilities Improvement				PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Inclement Weather Sensor System (mid range IR)																							
Fiscal Year	2008				2009				2010																											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Assessment			△																																	
Concept of Employment				△																																
System Development Spiral 1 Development (LPR) Spiral 2 Development (TF&I9)					△		△		△																											
Test & Evaluation Milestones Development Test Operational Test						△			△		△																									
Production Milestones Procurement Specification												△																								
Deliveries																																				

R-4 Schedule Profile

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Intelligent Video	

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Assessment					△																											
Concept of Employment					△																											
System Development Spiral 1 Development (LPR) Spiral 2 Development (TF&I9)						△		△																								
Test & Evaluation Milestones Development Test Operational Test						△	△		△	△																						
Production Milestones Procurement Specification											△																					
Deliveries																																

R-4 Schedule Profile

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Low Frequency Continuous Wave	

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Assessment					△																											
Concept of Employment																																
System Development Spiral 1 Development (LPR) Spiral 2 Development (TF&I9)						△					△																					
Test & Evaluation Milestones Development Test Operational Test									△																							
Production Milestones Procurement Specification																																
Deliveries																																

R-4 Schedule Profile

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT		PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603725N / Facilities Improvement		3155 / Force Protection Ashore/Subproj: Floating Barrier Against Swarm Boat Attacks

Fiscal Year	2008				2009				2010																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Assessment									△																							
Concept of Employment									△																							
System Development Spiral 1 Development (LPR) Spiral 2 Development (TF&I9)										△		△																				
Test & Evaluation Milestones Development Test Operational Test											△																					
Production Milestones Procurement Specification																																
Deliveries																																

R-4 Schedule Profile

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Perimeter Estimating Model/Method					
Schedule Profile		FY 2008	FY 2009	FY 2010					
System Development (Spiral Development)									
Spiral Development		3Q							
Test & Evaluation									
Test & Evaluation (DT)		4Q							
Test & Evaluation (OT)			2Q						

R-4a Schedule Detail

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155/Force Protection Ashore/Subproj:Inclement Weather Sensor System(mid range IR)					
Schedule Profile		FY 2008	FY 2009	FY 2010					
Technology Assessment		3Q							
Concept of Employment		4Q							
System Development									
Sprial Development (LPN)			1Q						
Spiral Development (TF&I9)			3Q	1Q					
Test & Evaluation									
Test & Evaluation (DT)				1Q					
Test & Evaluation (OT)			2Q	3Q					
Production Milestones									
Procurement Specification				4Q					

R-4a Schedule Detail

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				**DATE:**	**May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Intelligent Video					
Schedule Profile		FY 2008	FY 2009	FY 2010					
Technology Assessment			1Q						
Concept of Employment			1Q						
System Development									
Sprial Development (LPR)			2Q						
Spiral Development (TF&I9)			4Q						
Test & Evaluation									
Test & Evaluation (DT)			2Q	1Q					
Test & Evaluation (OT)			3Q	2Q					
Production Milestones									
Procurement Specification				3Q					

R-4a Schedule Detail

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Low Frequency Continuous Wave					
Schedule Profile		FY 2008	FY 2009	FY 2010					
Technology Assessment			1Q						
System Development									
Sprial Development (LPR)			2Q						
Spiral Development (TF&I9)				3Q					
Test & Evaluation									
Test & Evaluation (DT)				1Q					

R-4a Schedule Detail

CLASSIFICATION:

Exhibit R-4a, Schedule Detail				DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facilities Improvement			PROJECT NUMBER AND NAME 3155 / Force Protection Ashore/Subproj: Floating Barrier Against Swarm Boat Attacks					
Schedule Profile		FY 2008	FY 2009	FY 2010					
Technology Assessment				1Q					
Concept of Employment				1Q					
System Development									
Sprial Development (LPR)				2Q					
Spiral Development (TF&I9)				4Q					
Test & Evaluation									
Test & Evaluation (DT)				3Q					
Test & Evaluation (OT)									
Production Milestones									

R-4a Schedule Detail

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 9999 / Congressional Adds

CONGRESSIONAL PLUS-UPS:

	FY 08	FY 09	FY 10	
9B91A				
Advanced Photovoltaic Material Integration Development	0.916	0.000	0.000	

(U) Investigate material issues and advanced material opportunities suitable for advanced prototyping development and demonstration to improve the performance of photovoltaics of the categories suitable for Naval facilities applications.

	FY 08	FY 09	FY 10	
9B92A				
Kinetic Hydropower System (KHPS) Turbine	3.085	2.393	0.000	

(U) Conduct a technical, operational, environmental and business study to determine the feasibility of generating power at a suitable location in Puget Sound using the Kinetic Hydropower Turbine System, from which power can be transmitted to a local commercial power grid or to a naval base(s) grid. The study, including the explorations for data will address: 1) the presence of suitably strong tidal currents to generate electricity with the kinetic turbines; 2) Proximity of such sites to ports and other infrastructure to facilitate cost effective construction and operational sustainment; 3) Proximity to electrical power grids/interconnections for distribution; 4) Adequate avoidance considerations for navigational Channels; 5) Regulatory and permitting issues; and 6) Environmental compatibility with fish/fisheries, marine mammals, other water uses and other environmental and demographic considerations. The study will conclusively identify all issues to enable effective discussions for agreements among Navy and Industry parties for the project continuation with design, fabrication, installation and demonstration of power generation, transmission, and cost effective power generation-grid operations and business activities to serve the Navy needs. Initiate critical design and tests of long lead components concurrently with the feasibility engineering and business study.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 9999 / Congressional Adds

CONGRESSIONAL PLUS-UPS:

	FY 08	FY 09	FY 10	
9B93A				
Swimmer Detection Sonar Network	1.157	3.190	0.000	

(U) Develop, install and demonstrate at the Portsmouth, NH Naval Shipyard water environment the Swimmer Detection Sonar Network, previously demonstrated successfully at Singapore and elsewhere. An advanced development prototype will be developed, installed, and tested to demonstrate performance in the temperature, salinity, currents, aqua-life, debris and industrial noise regime of the shipyard's waters. Consideration shall be given to installation designs to enable potential continuing development or operation if the fiscal year 2008 activities demonstrate adequate performance.

9D49A	FY 08	FY 09	FY 10	
Regenerative Fuel Cell Back-up Power	0.000	1.197	0.000	

(U) Investigate material issues, hydrogen storage issues, and improved fuel cells to allow and fabrication of a regenerative proton exchange membrane (PEM) fuel power system suitable for tactical applications.

9D48A	FY 08	FY 09	FY 10	
Over The Horizon Vessel Tracking	0.000	0.798	0.000	

(U) Over The Horizon Vessel Tracking Congressional Add funding is being transferred to NAVSEA for proper execution.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 9999 / Congressional Adds

CONGRESSIONAL PLUS-UPS:

9D47A	FY 08	FY 09	FY 10	
Hydrokinetic Power Generator (HPG)	0.000	1.596	0.000	

(U) This project will build and demonstrate a low-head hydrokinetic power generation system based on the phenomenon of vortex induced vibration. A fully developed system will be capable of supplying power to Navy facilities or instrumentation clusters. Vortex Hydrokinetic Power technology, (AKA Vortex Induced Vibration Aquatic Clean Energy or VIVACE), uses the phenomenon of vortex induced vibrations to extract useful kinetic energy from ocean and river currents. The technology is scalable and can produce energy over a wide range of current speeds, starting as low as 1 knot. VIVACE installations are submerged, non-obtrusive, environmentally compatible, modular, and have a high energy density. Once developed, this type of power generation can used for supporting Navy power needs in a number of areas including: power for coastal naval bases, instrumentation stations, autonomous underwater vehicle (AUV) battery recharge, off-shore stations, and idle ships.

9A12A	FY 08	FY 09	FY 10	
Permanent Magetic Linear Generator (PMLG)	0.000	1.995	0.000	

(U) The program will involve numerical and physical modeling to facilitate scaling the Phase I PMLG buoy design from 5kW to full capacity, estimated at between 100 kW and 250 kW. This effort will perform the remaining hydrodynamic modeling, identify the preferred direct drive rotary system, create a functional conceptual design, perform key experimental testing in Oregon State University wave and electric motor research laboratories, complete a preliminary design and design review, and establish the plan for a full scale design and build including cost and energy production estimates. These project and research steps are sequentially accomplished and are necessary to ensure a plan with flexibility and integrity toward identifying a cost effective and survivable wave energy conversion device. Through the sequential development of numerical modeling and experimental tests, the most feasible direct drive rotary power take-off system design concept will be identified. This will then become the subject of a preliminary full-scale design. The preliminary design will be used for system evaluation, energy production estimates, cost estimates, and a preliminary design review. This project will provide the information necessary for the determination of commercial feasibility before proceeding to a complete system design and full scale

EXHIBIT R-2a, RDT&E Project Justification		**DATE: May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 9999 / Congressional Adds

CONGRESSIONAL PLUS-UPS:

9D50A	FY 08	FY 09	FY 10	
Test Critical OTEC Components (TCCOA)	0.000	1.995	0.000	

(U) The contractor will design, construct and operate a heat exchanger test facility at the Hawaii Natural Energy Laboratory of Hawaii Authority (NELHA). The goal of this project is to provide heat transfer performance, corrosion and biofouling testing of heat exchangers in order to develop heat exchangers for use in commercial size Ocean Thermal Energy Conversion (OTEC) Plants. Heat exchanger performance modeling and new design development is intended to proceed in parallel with testing and share data and results from the test program. Heat exchanger test goals include: Design, develop and fully test a practical set of heat exchangers for use in commercial size OTEC plant; Determine the long term and short term corrosion characteristics of heat exchanger designs currently being considered for use; Determine if any difference exists between corrosion characteristics of 2200 feet deep water from 40" intake pipe at NELHA and 3000 feet deep water on 55" intake pipe at NELHA; evaluate anti-fouling techniques and demonstrate their successful operation; Test the performance of evaporators and condensers with both seawater and ammonia flows at various seawater and ammonia flow rates; Evaluate heat exchangers in parallel and series flow arrangements on both the seawater and ammonia circuits; Identify and/or originate heat exchanger design software that can accurately predict the performance obtained from heat exchanger testing; Analyze, evaluate and put into prototype form new heat exchanger designs to investigate heat exchanger arrangements, candidate materials, anti-corrosion processes and fabrication alternatives that require testing and evaluation.

9D51A	FY 08	FY 09	FY 10	
Wave Energy Power Generator System (WEPGS)	0.000	1.596	0.000	

(U) In conjunction with the U.S. Navy, the contractor will continue development of wave power technology as an alternate electric power source on DoD Bases and ultimately deliver power to Hawaiian Electric's grid. An advanced and efficient PowerBuoy will be interconnected at the offshore test site and deliver power to the Marine Corps Base, Hawaii (MCBH) grid through the submarine power cable. Buoy ocean testing will generate an operating history for wave power electrical generating systems at Naval bases. Program Objectives: Demonstrate wave power as a reliable alternative electric power source for power systems for DoD Bases; Evaluate the feasibility of wave power unit as a scaled up capacity power station; Deliver power to Hawaiian Electric's electrical grid.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE 0603739N, NAVY LOGISTIC PRODUCTIVITY			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**18.910**	**17.798**	**4.301**					
2920/Ordnance Management	**0.920**	**0.000**	**0.000**					
2955/JEDMICS	**2.455**	**2.838**	**2.920**					
3223/Logistics R&D	**0.000**	**0.000**	**0.984**					
3225/Ordnance PHST	**0.000**	**0.000**	**0.397**					
9999/Congressional Add	**15.535**	**14.960**	**0.000**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Ordnance Management 2920: Covers the conversion of Naval Operational Logistics Support Center (NOLSC) systems to the Ordnance Information Systems (OIS).

JEDMICS 2955: In FY85 Congress directed the Services and Defense Logistics Agency to permanently capture, manage and control engineering data in digital format so it would be available to support competitive spares re-procurement. The Joint Engineering Data Management Information & Control System (JEDMICS) program manages and controls 106,000,000 engineering images and has 25,000 authorized users responsible for over 70,000 user sessions per month. Over 2.5 million digital images are retrieved each month. New data and new users are added each month as DoD re-engineers its business processes to take advantage of digital data that is managed and controlled for corporate reuse. The JEDMICS system is deployed at 16 interoperable sites that service 600 locations worldwide. Data stored in JEDMICS is used for Logistics Support, Spares re-procurement, Weapons Systems procurement, Engineering, Maintenance, Distribution, Manufacturing, Air National Guard and Deployed Engineering Technical Services organizations. JEDMICS facilitates work process re-design since its brings the electronic drawings to the desktop, shop floor or flight line in real time eliminating walk, wait and slack time to retrieve drawings. Additionally, Administrative Lead Time, Repair Turn Around Time, ECP processing time, demilitarization time, and all cycle times dependent on engineering data have decreased with the real time availability of digital engineering data. JEDMICS also facilitates Electronic Commerce since it produces digital technical data packages that can be forwarded along with an electronic order. Funds are for Commercial Off The Shelf (COTS) test, evaluation and integration. JEDMICS development efforts are required to integrate and test COTS upgrades.

Logistics R&D 3223: Logistics Reseach & Development (R&D) is a new start to establish necessary stable resources required to facilitate robust, flexible Logistics R&D planning that will provide the means for NAVSUP to effectively pursue solutions to mission-related technology/capability gaps.

Ordnance PHST 3225: Ordnance Packaging Handling Storage and Transportation (PHST) is a new start. The RDT&E resources will focus on developing new Ordnance Handling Equipment (OHE) to replace the 25+ year old equipment presently used by the Fleet for Underway Replenishment (UNREP) operations. This OHE is a high cost and maintenance item. Development of new OHE can take advantage of new technology such as the CH-60 helicopter, which has double the lift capacity of the CH-46. OHE is used daily by the war fighter to conduct Connected Replenishment (CONREP) and Vertical Replenishment (VERTREP). Ordnance PHST will additionally conduct a baseline study of the current Naval PHST logistics system to identify inefficiencies and recommend hardware and operational enhancements.

Congressional Adds 9999

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**	R-1 ITEM NOMENCLATURE 0603739N, NAVY LOGISTIC PRODUCTIVITY

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
President's Budget 2009	19.401	2.846	2.962
President's Budget 2010	18.910	17.798	4.301
Total Adjustments	-0.491	14.952	1.339
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		15.000	
SBIR/STTR/FTT Assessments	-0.491		
Program Adjustments			1.339
Rate/Misc Adjustments		-0.048	
Subtotal	-0.491	14.952	1.339

Schedule:

Not Applicable

Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 2920, Ordnance Management			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**0.920**							
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Naval Operational Logistics Support Center (NOLSC) systems conversion to the Ordnance Information Systems (OIS): The OIS is an umbrella concept that integrates approximately 12 different functions that are currently produced by "stove-pipe" systems. OIS is an integrated suite of tools that uses the latest available information technology and best commercial practices to provide timely, relevant and accurate ordnance information and global ordnance visibility. It integrates wholesale, retail, and unique ordnance decision support systems to facilitate global ordnance positioning and information sharing across the DoN ordnance community to maximize warfighter support. Without a robust ordnance information system, the Navy and Marine Corps Aviation's ability to prevail in combat is jeopardized. This degradation will increase exponentially in the joint environment and the RDT&E initiatives listed herein are designed to ensure maximum Information Technology (IT) capability.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	2920, Ordnance Management

B. Accomplishments/Planned Program

Software Development and Training	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.920			
RDT&E Articles Quantity				

Naval Operational Logistics Support Center (NOLSC) software development, training development, and configuration management for the following systems: Packaging, Handling, Storage &Transportation (PHST), Production / Industrial Base Support and Weapons Allocation Capability.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	2920, Ordnance Management

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
Not Applicable			

D. ACQUISITION STRATEGY:

The funding was placed on contract to six different vendors. The primary types of contracts utilized were the Cost plus Fixed Fee and Time & Material.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 2955, JEDMICS			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**2.455**	**2.838**	**2.920**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

In FY85 Congress directed the Services and Defense Logistics Agency to permanently capture, manage and control engineering data in digital format so it would be available to support competitive spares re-procurement. The Joint Engineering Data Management Information & Control System (JEDMICS) program manages and controls 106,000,000 engineering images and has 25,000 authorized users responsible for over 70,000 user sessions per month. Over 2.5 million digital images are retrieved each month. New data and new users are added each month as DoD re-engineers its business processes to take advantage of digital data that is managed and controlled for corporate reuse. The JEDMICS system is deployed at 16 interoperable sites that service 600 locations worldwide. Data stored in JEDMICS is used for Logistics Support, Spares re-procurement, Weapons Systems procurement, Engineering, Maintenance, Distribution, Manufacturing, Air National Guard and Deployed Engineering Technical Services organizations. JEDMICS facilitates work process re-design since its brings the electronic drawings to the desktop, shop floor or flight line in real time eliminating walk, wait and slack time to retrieve drawings. Additionally, Administrative Lead Time, Repair Turn Around Time, ECP processing time, demilitarization time, and all cycle times dependent on engineering data have decreased with the real time availability of digital engineering data. JEDMICS also facilitates Electronic Commerce since it produces digital technical data packages that can be forwarded along with an electronic order. Funds are for Commercial Off The Shelf (COTS) test, evaluation and integration. JEDMICS development efforts are required to integrate and test COTS upgrades.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	2955, JEDMICS

B. Accomplishments/Planned Program

JEDMICS Development	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	2.349	2.763	2.843	
RDT&E Articles Quantity				

Conduct development efforts associated with COTS obsolescence of the fully deployed COTS intensive JEDMICS system. Conduct COTS requirements definition, evaluation, integration and testing of annual baseline releases. Conduct technology insertion of the JEDMICS system that is required to protect the $21B digital data asset managed in JEDMICS.

JEDMICS Test	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.025	0.025	0.025	
RDT&E Articles Quantity				

Conduct test and readiness reviews and functional performance tests on JEDMICS system.

JEDMICS Evaluation & Review	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.081	0.050	0.052	
RDT&E Articles Quantity				

Conduct technical evaluations and configuration control reviews of JEDMICS system.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	2955, JEDMICS

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
Not Applicable			

D. ACQUISITION STRATEGY:

Execution of sole-source negotiated requirements type contract for engineering, design, development and test efforts. Performance-based reviews conducted quarterly by the Project Management Office.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)							DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603739N, NAVY LOGISTIC PRODUCTIVITY			PROJECT NUMBER AND NAME 2955, JEDMICS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Subtotal Product Development			0.000	0.000		0.000						
Remarks:												
Development Support	Various	Various	0.095	0.210	10/08	0.214	10/09					
Software Development	Various	Various	0.216									
Software Development	*SS-ID/RE	Northrop Grumman IT, VA	17.434	2.553	11/08	2.629	11/09					
Subtotal Support			17.745	2.763		2.843						

Remarks: Funds are for development efforts associated with Commercial Off The Shelf (COTS) obsolescence on the fully deployed COTS Intensive Joint Engineering Data Management Infomation & Control System (JEDMICS). Funds are for COTS evaulation, integration, and test and evaluation. The common baseline will be regained and obsolete COTS software and hardware will be replaced. Baseline releases will protect joint interoperability, upgrade operating systems for security patches and supportable versions, support integration to replace obsolete COTS, and upgrade the Oracle database to supportable versions.

* Sole Source Indefinite Delivery/Requirements Contract

CLASSIFICATION:

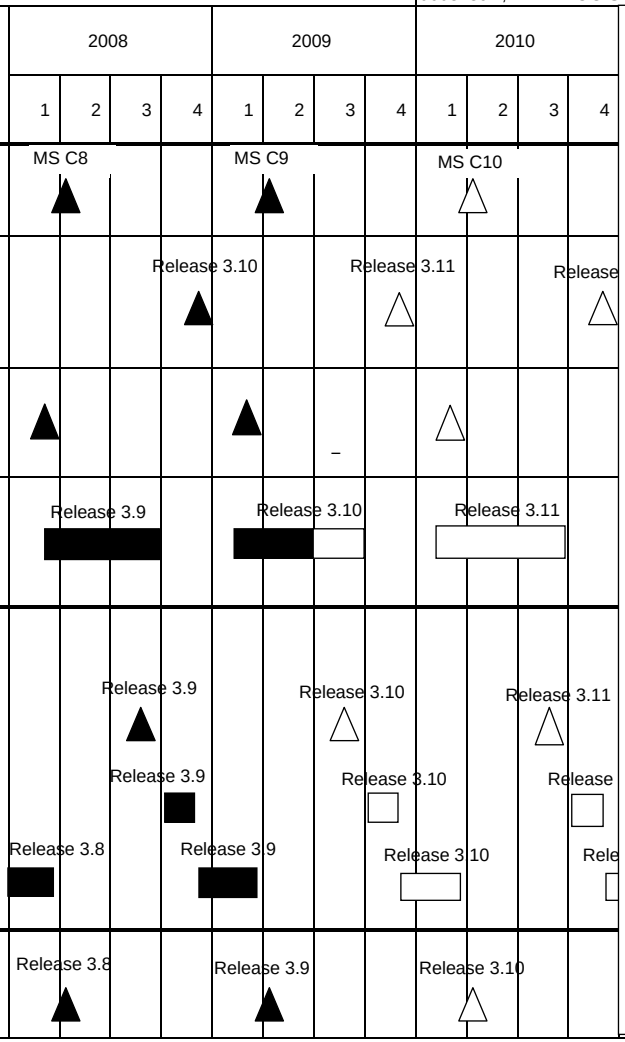
Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603739N, NAVY LOGISTIC PRODUCTIVITY			PROJECT NUMBER AND NAME 2955, JEDMICS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	Various	Various	2.345	0.025	10/08	0.025	10/09					
Subtotal T&E			2.345	0.025		0.025						
Remarks: Supports testing and evaluation of baseline releases in a user environment.												
Government Engineering Support	Various	Various	1.083									
Program Management Support	WX	Various	0.182	0.015	10/08	0.016	10/09					
Travel	Various	Various	0.179	0.035	Various	0.036	Various					
Subtotal Management			1.444	0.050		0.052						
Remarks: Supports requirements management at the Prime Contractor location and program related travel by government employees.												
Total Cost			21.534	2.838		2.920						
Remarks:												

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	2955, JEDMICS



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CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 2955, JEDMICS			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Alpha/Beta Testing Release 3.8	1Q							
Contract Award	1Q							
Software Hardware Evaluation/Integration Release 3.9	1Q-3Q							
Engineering Change Package Release 3.8	2Q							
Milestone C8 (MS C8) Release 3.8	2Q							
Risk Assessment Release 3.9	3Q							
Developmental/Functional Testing Release 3.9	4Q							
Service IPT/ECPs Release 3.10	4Q							
Alpha/Beta Testing Release 3.9	4Q	1Q						
Contract Award		1Q						
Software Hardware Evaluation/Integration Release 3.10		1Q-3Q						
Engineering Change Package Release 3.9		2Q						
Milestone C9 (MS C9) Release 3.9		2Q						
Risk Assessment Release 3.10		3Q						
Developmental/Functional Testing Release 3.10		4Q						
Service IPT/ECPs Release 3.11		4Q						
Alpha/Beta Testing Release 3.10		4Q	1Q					
Contract Award			1Q					
Software Hardware Evaluation/Integration Release 3.11			1Q-3Q					
Engineering Change Package Release 3.10			2Q					
Milestone C10 (MS C10) Release 3.10			2Q					
Risk Assessment Release 3.11			3Q					
Developmental/Functional Testing Release 3.11			4Q					
Service IPT/ECPs Release 3.12			4Q					
Alpha/Beta Testing Release 3.11			4Q					
Contract Award								
Software Hardware Evaluation/Integration Release 3.12								
Engineering Change Package Release 3.11								
Milestone C11 (MS C11) Release 3.11								
Risk Assessment Release 3.12								
Developmental/Functional Testing Release 3.12								
Service IPT/ECPs Release 3.13								
Alpha/Beta Testing Release 3.12								
Contract Award								
Software Hardware Evaluation/Integration Release 3.13								

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 3223, Logistics R&D			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost			**0.984**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Stable annual funding is required to facilitate implementation and execution of a robust, flexible Logistics R&D program that will provide the means for Naval Supply Systems Command (NAVSUP) to effectively pursue solutions to mission-related capability/technology gaps. The NAVSUP Logistics R&D program has an established infrastructure and business process for ensuring that R&D funds are applied to projects that address high priority enterprise needs established in accordance with OPNAV goals and the NAVSUP Commander's Guidance.

From an infrastructure perspective, Log R&D investments are governed by a NAVSUP enterprise-wide Executive Steering Group (ESG) chaired by the NAVSUP Vice Commander, and comprised of SES and Command leadership representatives. The ESG ratifies capability/technology gaps identified by all activities within the enterprise, and then assesses and prioritizes all proposed Log R&D initiatives in accordance with their potential for filling the established gap and generating return on investment.

The established Log R&D business management process has currently identified capability/technology gaps in the following general areas: 1) the need to develop technology enhancements promoting the movement of shipboard supply operations ashore, especially as it relates to optimally manned ships, 2) developing and/or modernizing shipboard equipment, material or processes for which NAVSUP exercises Technical Authority, and 3) developing and modernizing Information Technology (IT) and Automatic Identification Technology (AIT) applications to enhance performance of supply chain management and logistics functions (e.g., remote diagnostics/prognostics, in-transit visibility, unique item identification) that are not supported by Navy ERP. This modest R&D investment will establish a NAVSUP Logistics R&D Program to explore additional technologies and significantly increase potential cost savings.

Examples of specific issues/projects that are under consideration for investment of Log R&D funding as a result of the FY09 NAVSUP capability/technology gap review include: use of commercially available software to move shipboard retail inventory management operations ashore and reduce shipboard manning (Retail Operations Management - Enterprise Support); development of Electro-Magnetic Radiation (EMR)-free AIT tools to manage shipboard Ordnance inventories (EMR-free Ordnance Inventory Tools); use of alternatives in lieu of identification cards for facilitating military cash transactions (Next Generation Navy Cash); development of a low cost, fire retardant Navy uniform fabric to improve personnel safety and affordability (Low-Cost, Durable Fire-Retardant Navy Uniform Fabric); and establishment of remote, real time condition monitoring for critical assets (such as rocket motors) to preclude unnecessary, phased replacement of high cost components (Remote, Real-time Condition Monitoring). This list of potential projects for addressing capability/technology gaps will be updated and prioritized over time, under the oversight of the NAVSUP Log R&D ESG, to ensure that funds allocated provide the highest return on investment consistent with Navy/NAVSUP goals and objectives.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY	PROJECT NUMBER AND NAME 3223, Logistics R&D

B. Accomplishments/Planned Program

Rocket/Missile Motor Remote Monitoring	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.684	
RDT&E Articles Quantity				

Rocket/Missile Motor Remote Condition Monitoring. Cost avoidance due to the elimination of unnecessary rework/retirement of suitable motors based on statistically insignificant assessments. Up to 98% “service life threshold” replacement assessments are incorrect (~ 245 motors for just the Navy Standard Missile). Funds to provide initial year of multi-year Integrated Product & Process Development (IPPD) effort.

Retail Operations Management - ES	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.300	
RDT&E Articles Quantity				

Retail Operations Management - Enterprise Support. Replace existing stand-alone retail systems on 155 ships with commercial-off-the-shelf (COTS) retail point of sale (POS) applications connected to a back office accounting and inventory control system located ashore. Effort will allow commensurate reduction in military personnel afloat. Funds to provide for first of two-year IPPD.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	3223, Logistics R&D

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
Not Applicable			

D. ACQUISITION STRATEGY:

The acquiston strategy for each individual sub-project will be determined during FY09.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 3225, Ordnance PHST			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost			**0.397**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The RDT&E resources will focus on developing new Ordnance Handling Equipment (OHE) to replace the 25+ year old equipment presently used by the Fleet for Underway Replenishment (UNREP) operations. This OHE is a high cost and maintenance item. Development of new OHE can take advantage of new technology such as the CH-60 helicopter, which has double the lift capacity of the CH-46. OHE is used daily by the war fighter to conduct Connected Replenishment (CONREP) and Vertical Replenishment (VERTREP). A sample of these efforts will include redesigning the MK 105 sling to increase efficiency during VERTREP, condensing entire families of slings down to fewer and more efficient pieces of gear, developing a stream strongback and the associated equipment necessary to complement, not compromise, the Heavy UNREP initiative of the future, etc. The new sling designs will take advantage of present and future manufacturing and operational capabilities. This initiative will improve availability, reliability, and maintainability while reducing overall cost. The end result will be a Fleet that has been properly equipped to conduct UNREP with more efficiency.

The PHST Center will develop a baseline of the current naval ordnance PHST logistics system. This baseline will identify inefficiencies and recommend hardware and operational enhancements in the area of modal change, thus providing an investment strategy for future Naval PHST operations by conducting an end-to-end study.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 20009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	3225, Ordnance PHST

B. Accomplishments/Planned Program

Ordnance PHST Development	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			0.397	
RDT&E Articles Quantity				

Develop new Ordnance Handling Equipment (OHE) to replace the 25+ year old equipment presently in Fleet useto include: 1) Re-design Mk 105 Pendant Sling to optimize cost and throughput during Vertical Replenishment; 2) New concept development to replace 12x12 and 14x14 ft. Nylon Cargo Nets ; 3) Design a new STREAM Strongback to compliment the Fleet's Heavy UNREP initiative of the future; 4) Condense Mk 85, 86, 87, and 100 family of pallet slings into fewer pieces gear to optimize cost and efficiency during CONREP; and 5) Re-design the Mk 45 Handlift Truck. Ordnance Packaging Handling Storage and Transportation (PHST) will additionallyconduct a baseline study of the current Naval PHST logistics system to identify inefficiencies and recommend hardware and operational enhancements.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	3225, Ordnance PHST

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
Not Applicable			

D. ACQUISITION STRATEGY:

Execution of in-house engineering, design, development and test efforts. Performance-based reviews conducted quarterly or as required by the Project Management Office.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY				PROJECT NUMBER AND NAME 9999, Congressional Add			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**15.535**	**14.960**						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:
Congressional Add:

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	9999, Congressional Add

B. Accomplishments/Planned Program

9541A Infrared Sensors	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.091			
RDT&E Articles Quantity				

Multi-color infrared sensors - A continuation of the FY06 Service Life Extension of Avionics Legacy Equipment with Guaranteed System (SEALEGS) program.

9A13A Defense Integrated Technical Data Center	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.157			
RDT&E Articles Quantity				

Defense Integrated Technical Data Center - This program will create an infrastructure with a set of applications to facilitate the sharing of weapons system product information between the members of the engineering and logistics communities to improve shipboard maintenance processes and sustain shipboard readiness. This will be accomplished by creating access within a single tool to critical technical (manuals, data packages, drawings, equipment configuration data, etc.) and supply (asset availability) information required to support the afloat maintenance process.

9A20A Unique Identification of Tangible Items	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	8.194	2.991		
RDT&E Articles Quantity				

Unique Identification of Tangible Items - The UID Policy is an OSD mandate that will, once implemented, provide a means to track items from cradle to grave and provide the means to track the requirement footprint, streamline vendor payment via the Supply Chain, and provide procurement accountability.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603739N, NAVY LOGISTIC PRODUCTIVITY	PROJECT NUMBER AND NAME 9999, Congressional Add

B. Accomplishments/Planned Program

9B17A Thin Materials for Advanced Applications	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		2.992		
RDT&E Articles Quantity				

Thin Materials for Advanced Applications - The purpose of these funds is for the development of X-ray Lithography (XRL) / Collimated Plasma Lithography (CPL) mask materials/technology.

9B94A Highly Integrated Optical Interconnects	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.550	1.596		
RDT&E Articles Quantity				

Highly Integrated Optical Interconnects - Funds are provided to develop optical interconnects integrated into printed circuit boards typically used by the electronics industry.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	9999, Congressional Add

B. Accomplishments/Planned Program

9B95A National Item Identificiation Number	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.543			
RDT&E Articles Quantity				

National Item Identificiation Number -Funds are to assist in improving the maintenance process for aircraft and aviation components which are re-worked/repaired at organic Fleet Readiness Centers (FRCs - formerly Naval Aviation Depots). That maintenance process is supported by a tool called the Automated Data Capture System (ADCS) which the FRCs use during aircraft examination and evaluation inspections to collect repair requirements and Reliability Centered Maintenance (RCM) data against identified discrepancies, with specific material requirements tied to individual discrepancies. The material requirement information is provided by ADCS to the FRCs' material sourcing system, which allows the FRCs to source the material without manual intervention. However, the current accuracy of the FRC material databases is degraded to the point where manual intervention is required to correctly identify and source more than 40% of the material requirements. As a result, this add was provided to explore technological solutions for automatically detecting and correcting errors in the data required by ADCS to support automated material requirement identification. The result will be a more streamlined and cost effective process for repair/re-work of major aviation support components.

9D53A Advanced Naval Logistics	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		1.596		
RDT&E Articles Quantity				

Advanced Naval Logistics - This program will develop and implement advanced forecasting and spare parts requirements determination tools whose end purpose is to reduce investment ir spare parts without sacrificing readiness. It will also investigate ways to collaboratively determine spares requirements between the Navy and DLA and to lease commercial software and investigate the applicability of this tool as a standard requirements determination approach for all DOD Services.

9D54A RFID Tech Program	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.798		
RDT&E Articles Quantity				

FY09 Congressional add funds provided for RFID Tech Program.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	9999, Congressional Add

B. Accomplishments/Planned Program

9D56A Zero-Standoff Hero-Compliant RFID	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		1.596		
RDT&E Articles Quantity				

Zero-Standoff HERO-Compliant RFID - This program will develop a safe passive RFID system which is needed to actually be able to implement passive RFID throughout the Navy and safely operate in near proximity to ordnance at afloat and ashore Navy ships and facilities. Provides a mechanism to readily receipt, inventory, store and issue material using passive RFID tags into the Navy Systems of Record for immediate acknowledements of material location, such as receipt of material without physical intervention of scanning bar codes or manual keyboard input. Will provide greater asset visibility, reduced manpower burden and better asset accountability in the supply pipeline.

9D57A Field Support for Fiber Optic Cable	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		1.596		
RDT&E Articles Quantity				

Field Support for Fiber Optic Cable - Funds provided to develop a high quality, low cost field repair technology for fiber optic cables being installed in a number of the Navy's aerospace platforms. Fusion splicing technology is currently used by the commercial telecom industry to repair optical fiber quickly and permanently. This congressional add will take existing technology and modify it to work in the military aerospace environment to improve fiber optic logistics footprint.

9D58A Integrated Product Support Data Mgmt Syster	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.997		
RDT&E Articles Quantity				

Integrated Product Support Data Management System (IPSDMS) - Funded to build and prototype a single, integrated configuration managed supply chain material management system that can be used across the Navy Enterprise (Acquisition, Fleet, Maintenance, Supply, Training, etc.) to improve the quality and timeliness of readiness-oriented assessments, readiness-based spare parts analyses, spare/repair parts procurements, and improvements in materiel and maintenance response times. The goal is to implement material management functions with commercial off-the-shelf systems or DOD standard data systems for supply chain management information systems to provide timely access to accurate, actionable information across logistics processes which will enable real-time logistics situational awareness and execution. Tasked to develop supply chain data management strategies that promote the use of shared data by implementing an information exchange that supports coordination and collaboration between the DOD supply chain functions and activities, including commercial partners.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603739N, NAVY LOGISTIC PRODUCTIVITY	9999, Congressional Add

B. Accomplishments/Planned Program

9D59A NAVAIR Distance Support Environment	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.798		
RDT&E Articles Quantity				

NAVAIR Distance Support Environment - This program will be identifying the requirements for a single, integrated configuration managed Product Data Management (PDM) system that can easily interoperate with existing systems and be used across the Navy Enterprise (Acquisition, Fleet, Maintenance, Supply, Training) that provides an effective fleet interaction mechanism while simultaneously providing a way to establish, maintain and communicate weapon system product information to the Fleet, the contractor community and NAVAIR.

R-1 SHOPPING LIST - Item No. 61

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603755N/SHIP SELF DEFENSE - DEM/VAL**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	10.617	10.966	6.960				
2133 / QRCC	5.457	3.582	3.563				
2184 / Force AAW Coordination Technology	5.160	7.384	3.397				

A. MISSION DESCRIPTION:

This program incorporates efforts dedicated to the enhancement of ship defense against Anti-Air Warfare (AAW) and other evolving threats. Its primary focus is on the development of technologies, systems, and procedures necessary to defeat the evolving Anti-Ship Cruise Missile (ASCM) threat and then expands to allow for application of these technologies in other warfighting areas. These projects focus on ship defense improvements through the development of advanced concepts and capabilities that will enhance both defense in depth of ships in a force and self defense of individual ships in a littoral war-fighting environment.

Quick Reaction Combat Capability (QRCC) Requirements Analysis Working Group (RAWG), Project 2133, provides independent analysis for a variety of combat system AAW self-defense cost-benefits trade, ship class performance studies, and force protection strategic plan development.

Force Advanced Warfare Concept Technology (FACT), Project 2184, demonstrates concepts and capabilities that will enhance the warfighting ability of ships and aircraft and enable the coupling of the Force into a single, distributed weapon system through more effective use of tactical data, and force sensors and weapons. During FY06, the Innovation Team expanded the Offensive Counter Air (OCA) capabilities developed for the Joint Targeting Attack and Assessment Capability (JTAAC) utilizing electro-optical (EO) and infrared (IR) sensors to include other sensors.

During FY08, the Ocean Surveillance Initiative, the Innovation Team continued to leverage their expertise in resolving complex warfighter issues as well as the end to end capability realized in previous products to develop a prototype focused on creating a coherent and consistent tactical surface track picture. JTAAC brought innovative technology to offensive counter air and the Ocean Surveillance Initiative will extend those advancements to the surface track picture and engagement domains. During FY09 the OSI development will continue with emphasis on advanced prototyping and transition of technologies for planning and detection capabilities required to detect and track surface targets in support of the Over the Horizon Targetting mission; to include documenting the mission requirements as well as generate associated technical specifications and standards. In FY10, the Innovation Team will begin to build and perform proof of concept on technologies and capabilities required to provide engagement quality data quality data.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603755N/SHIP SELF DEFENSE - DEM/VAL**				
B. PROGRAM CHANGE SUMMARY:							
Funding:	FY 2008	FY 2009	FY 2010				
FY09 President's Budget	10.719	11.001	10.803				
FY10 President's Budget	10.617	10.966	6.960				
Total Adjustments	-0.102	-0.035	-3.843				
(U) Summary of Adjustments							
Congressional Adjustments	0.000	-0.030	0.000				
SBIR/STTR/FTT Assessment	-0.089	0.000	0.000				
Program Adjustments	0.000	0.000	-3.738				
Rate/Misc Adjustments	-0.013	-0.005	-0.105				
Total	-0.102	-0.035	-3.843				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**				PROJECT NUMBER AND NAME **2133/QRCC**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	5.457	3.582	3.563				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Requirements and Analysis Working Group (RAWG) provides independent analysis for a variety of combat system trade-offs, ship class performance studies, and force protection strategic plan development.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**	PROJECT NUMBER AND NAME **2133/QRCC**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	5.457	3.582	3.563
RDT&E Articles Quantity	0	0	0

FY 08 - FY 10 The QRCC RAWG will continue to analyze Ship Self Defense as well as force level performance impacts on self-defense capabilities. QRCC will provide leadership and management of the Common ASCM Anti Ship Cruise Missile (ACSM) Threat Characterization process for PEO IWS. The RAWG will continue to analyze Ship Self Defense Probability of Raid Annihilation (PRA) capabilities and participate and attend PRA working group meetings.

C. OTHER PROGRAM FUNDING SUMMARY:

The RAWG will analyze Ship Self Defense capabilities, as well as force level performance impacts on self-defense capabilities. Analysis will include Program of Record (PoR) requirements, proposed combat system self-defense configurations, and excursions based on raid size, environment, and other operational considerations. The RAWG will participate in and attend PRA working group meetings.

D. ACQUISITION STRATEGY:

N/A

CLASSIFICATION:	UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**			PROJECT NUMBER AND NAME **2133/QRCC**					
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			
System Engineering	WR	NSWC DD/Dahlgren,VA	13.828	3.582	OCT-08	3.563	NOV-09			
Subtotal Product Development			**13.828**	**3.582**		**3.563**				
Remarks:										
Subtotal Support Costs			**0.000**	**0.000**		**0.000**				
Remarks:										
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**				
Remarks:										
Subtotal Management Services			**0.000**	**0.000**		**0.000**				
Remarks:										
Total Cost			**13.828**	**3.582**		**3.563**				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**				PROJECT NUMBER AND NAME **2184/Force AAW Coordination Technology**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	5.160	7.384	3.397				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Force Advanced Warfare Concept Technology (FACT) Program is an advanced development effort designed to demonstrate Advanced Force concepts and capabilities that will significantly improve our Force defense in depth, including both local area and self defense capabilities against current and future threats. FACT improvements are designed to enhance the warfighting ability of ships and aircraft and to enable coupling of the Force into a single, distributed weapon system and towards more effective use of tactical data and the cooperative use of all the force sensors and weapons. These capabilities will provide the ship offensive flexibility needed to meet the threat brought about by increasing numbers of highly sophisticated weapons held by potentially hostile third world countries. FACT defines requirements and develops prototype systems or modifications to existing systems to test new concepts for the coordination of Force operations. FACT is a model innovation cell which consistently delivers advanced war-fighting capability that addresses current Fleet shortfalls and needs quickly and cost effectively. Some examples of prototype systems now in production are AN/SPS-48C Detection Data Converter, AN/SPS-48E Environmental Control Feature, Shipboard Gridlock System/Automatic Correlation (SGS/AC) and Dial-a-Track Quality (Link-11 Quality Selection). Other FACT developments include the Automatic Identification System (Auto-ID) and the Multi-Frequency Link-11 capability; Dual Net Multi-Frequency Link-11 (DNMFL); Force Threat Evaluation Weapons Assignment (FTEWA); the prototype Area Air Defense Commander (AADC) and the Joint Targeting Attack and Assessment Capability (JTAAC).

In FY08, under 2184, the Ocean Surveillance Initiative (OSI) under FACT, continued the initiative to provide a persistent wide area tactical surface track picture. In developing OSI, the FACT team is coordinating with other organizations to include a variety of Navy programs and the Department of Homeland Security (U.S. Coast Guard and Customs and Border Protection (CBP)) to leverage off of experimentation opportunities and mission area expertise to develop capabilities in response to satisfying Navy objectives. During FY09 the OSI development will continue with emphasis on advanced prototyping and transition of technologies for planning and detection capabilities required to detect and track surface targets in support of Over the Horizon Targeting mission; including documenting mission requirements as well as generate associated technical specifications and standards. Based on the knowledge gained during the OSI development, in FY10, the Innovation Team will begin building and performing proof of concept on technologies and capabilities required to provide engagement quality data.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**	PROJECT NUMBER AND NAME **2184/Force AAW Coordination Technology**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	5.160	7.384	3.397
RDT&E Articles Quantity	0	0	0

Conduct critical FACT initiative proof of concept experiments. Provide top level programmatic support, technical analysis and assist in the development processes, procedures and documentation that impact the execution of the FACT program requirements. FACT and Ocean Surveillence Initiative efforts will combine and continue under Project 2184 in FY08. On-going development of an Ocean Surveillance Initiative prototype which will leverage the end to end capability realized by JTAAC and have the objective goal of attaining a tactically significant probability of detection, continuous track, and correct classification of small and medium sized vessels at sea state 5. Conduct critical experiments in support of the Ocean Surveillance Initiative. During FY09 the OSI development will continue with emphasis on advanced prototyping and transition of technologies for planning and detection capabilities required to detect and track surface targets in support of Over the Horizon Targeting mission; including documenting mission requirements as well as generate associated technical specifications and standards. Provide top level support, technical analysis and assist in the development processes, procedures and documentation that impact the execution of the Ocean Surveillance

C. OTHER PROGRAM FUNDING SUMMARY:
Not Applicable

D. ACQUISITION STRATEGY:
Not Applicable

CLASSIFICATION:		UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**			PROJECT NUMBER AND NAME **2184/Force AAW Coordination Technology**					
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			
Primary Hardware Development	SS/CPFF	APL/Laurel, MD	13.721	6.963	NOV-08	2.976	NOV-09			
Subtotal Product Development			**13.721**	**6.963**		**2.976**				
Remarks:										
Support Costs	C/CPFF	DELTA/Arlington, VA	0.650	0.421	NOV-08	0.421	NOV-09			
Subtotal Support Costs			**0.650**	**0.421**		**0.421**				
Remarks:										
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**				
Remarks:										
Subtotal Management Services			**0.000**	**0.000**		**0.000**				
Remarks:										
Total Cost			**14.371**	**7.384**		**3.397**				

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**	PROJECT NUMBER AND NAME **2184/Force AAW Coordination Technology**

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Support GWOT Operations												
Support Transtion of JTAAC												
Begin Ocean Surveillance Initiative	△	△	△		△ Begin Transition △							
		Exercise Prototype Capability										
Identify Technical Gaps									△	Begin		
Perform Data Collection										△	Begin	
Develop Technologies											△	
Exercise Ptototype Capability												
Data Analysis												

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603755N/SHIP SELF DEFENSE - DEM/VAL**			PROJECT NUMBER AND NAME **2184/Force AAW Coordination Technology**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Phase 2 Data Collection with Customs & Border Protection	1Q						
Exercise Prototype Capability	2Q, 3Q	1Q					
Begin Transition for Ocean Surveillance Technology		1Q					
Identify Technical Gaps			1Q				
Data Collection			2Q				
Develop Technologies			3Q				

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-2

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N
PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT

COST: (Dollars in Millions)

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Total PE	10.960	10.094	10.194
2293 NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)	10.960	10.094	10.194

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In accordance with Title 10 United States Code, Section 2350a, this Program Element provides funding for research and development (R&D) programs with approved allies under international agreements. These funds can only be applied to work efforts in the U.S., and the Under Secretary of Defense, Acquisition and Technology and Logistics (USD, AT&L) must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate Summary Statement of Intent (SSOI) that also states why the project serves to increase the defense capabilities of the U.S. The SSOI is used to obtain Project approval by the Department of the Navy and the Office of the Secretary of Defense.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N
PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT

B. PROGRAM CHANGE SUMMARY:

	FY 2008	FY 2009	FY 2010
Previous President's Budget	9.797	10.129	10.333
Congressional Program Reductions	0.000	-0.027	0.000
Program Adjustments	0.000	0.000	-0.140
Rate/Misc Adjustments	0.000	-0.008	0.001
SBIR/STTR Transfer	-0.037	0.000	0.000
Total Reprogrammings	1.200	0.000	0.000
Current BES/President's Budget	10.960	10.094	10.194

PROGRAM CHANGE SUMMARY EXPLANATION:
Technical: Not applicable.

Schedule: Not applicable.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable.

E. PERFORMANCE METRICS:
The intent of the North Atlantic Treaty Organization (NATO) cooperative R&D program is to provide "start-up" funds for projects seeking allied contributions into cooperative research and development projects with the U.S. The primary metric used in the program is foreign contributions into projects supported by the program. The performance goal is met if total foreign contributions into projects exceed total NATO cooperative R&D program funds by over 100%.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

COST: (Dollars in Millions)

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
2293 NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)	10.960	10.094	10.194

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In accordance with Title 10 U.S. Code Section 2350a, this project provides funding for research and development projects with approved allies under international agreements. These funds can only be applied to work efforts in the U.S., and the Office of Secretary of Defense must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate SSOI which also states why the project serves to increase the conventional defense capabilities of the U.S. The SSOI is used to obtain project approval by the Department of the Navy and the Office of the Secretary of Defense.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
COOPERATIVE PROJECTS	10.960	10.094	10.194

FY 2008 Accomplishments:

- Continued to provide support for the identification and development of international agreements with one or more approved major allies for the purpose of conducting cooperative research and development projects on defense equipment and munitions. These international agreements are approved by USD AT&L and are submitted in separate SSOIs.
- Continued to support the Advanced Hull Materials and Structures Technology (AHM&ST) cooperative project between the U.S. and Japan.
- Continued to support the cooperative Failure Prediction of Composite and Hybrid Naval Structures (DYCOSS 3D) project between the U.S. and the Netherlands.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

- Completed support for the Multi-Statics Sonar cooperative project between the U.S. and Singapore.
- Completed support for the Torpedo Countermeasures ELF Sensor System cooperative project between the U.S. and Germany.
- Completed support for the Japan/United States Radar Research (JUSRR) cooperative project between the U.S. and Japan.
- Completed support for the Unmanned Undersea Vehicles (UUV), Intelligence, Surveillance and Reconnaissance (ISR) and Anti-Submarine Warfare (ASW) cooperative project between the U.S. and the U.K.
- Completed support for the Australia/United States Phased Array Radar (AUSPAR) cooperative project between the U.S. and Australia.
- Completed support for the Open Architecture cooperative project between the U.S. and Japan.
- Completed support for the Australia/United States Distributed Engineering Plan (AUSDEP) cooperative project between the U.S. and Australia.
- Completed support for the Low Cost Guided Imaging Rocket (LOGIR) cooperative project between the U.S. and the Republic of Korea.
- Completed support for the Infrared Hyperspectral Imaging at Wavelengths Beyond 3um cooperative project between the U.S. and Singapore.
- Initiated support for amendment one to the Advanced Radar Technology Integrated System Testbed cooperative project between the U.S. and the U.K.
- Initiated support for the Multiplexed Fiber Laser Sensors cooperative project between the U.S. and Australia.
- Initiated support for Torpedo Guidance and Control; False Targets project between the U.S. and U.K.
- Planned support for the Open Architecture Radar Interface Standard Project (OARIS) cooperative project between the U.S. and multiple nations.
- Planned support for the Coalition Maritime Missile Defense Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) Architecture Definition PA2 cooperative project between the U.S. and multiple nations.
- Planned support for the ALR-67(v3) cooperative project between the U.S. and Australia.
- Planned support for enhancing and validating the Dynamic System Mechanics Advanced Simulation (DYSMAS) to meet Emerging Modeling and Simulation Changes cooperative project between the U.S. and Germany.
- Planned support for the Advanced Non-Acoustic Sensing Magnetometer Technologies cooperative project between the U.S. and Sweden.
- Planned support for the Multi-Intelligence Ship Detection Using Imagery (MISD-I) cooperative project between the U.S. and U.K.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

FY 2009 Plans:

- Continue to plan and/or support approved cooperative projects.
- Complete support for the Advanced Hull Materials and Structures Technology (AHM&ST) cooperative project between the U.S. and Japan.
- Plan support for the Alternate Material Propeller cooperative project between the U.S. and Australia.
- Plan support for the Surface Combatant Aluminum Structure Design cooperative project between the U.S., Finland and Germany.
- Plan support for the Submarine Hydrodynamics Maneuvering & Control cooperative project between the U.S. and the U.K.
- Plan support for the Maritime Missile Defense Modeling and Simulation Synthetic Interoperability Testing and Evaluation (Site) cooperative project between the U.S. and multiple nations.
- Plan support for the Coalition Distributed Engineering Plant Baseline Architecture (CDEP-BA) cooperative project between the U.S. and multiple nations.
- Plan support for the Submarine Sonar Advanced Processing Build-Acoustic Rapid COTS Insertion (APB-ARCI) Amendment 1 project between the U.S. and the U.K.
- Plan support for the Defensive Aids Suite/Next Generation Torpedo Defense project between the U.S. and the U.K.
- Plan support for the Submarine Sonar Telemetry project between the U.S. and the U.K.
- Plan support for the Six Degrees of Freedom (6DOF) Amendment 1 project between the U.S. and Italy.
- Plan support for the Coalition Network for Secure Information Sharing (CoNSIS) cooperative project between the U.S. and multiple nations.
- Plan and initiate support for the Medusa Joint Capability Technology Demonstration (JCTD) cooperative project between the U.S. and the Republic of Korea.

FY 2010 Plans:

- Continue to plan and/or support approved cooperative projects.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

C. OTHER PROGRAM FUNDING SUMMARY - NAVY RELATED RDT&E:
PE 0605853N Management, Technical & International Support
OTHER PROGRAM FUNDING SUMMARY - NON-NAVY RELATED RDT&E:
PE 0603923D8Z Coalition Warfare
PE 0605130D8Z Foreign Comparative Testing

D. ACQUISITION STRATEGY:
Not applicable.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

A. PROJECT COST BREAKDOWN: (Dollars in Millions)

Project Cost Categories	FY 2008	FY 2009	FY 2010
a. Cooperative Research and Development	10.960	10.094	10.194

B. BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION:

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 2008 Budget	FY 2009 Budget	FY 2010 Budget	To Complete	Total Program
Product Development									
NAVSEA	PD				3.689	2.026	3.317	CONT.	CONT.
NSWC	WX				3.219	2.867	2.765	CONT.	CONT.
NUWC	WX				1.345	.400	.450	CONT.	CONT.
SPAWAR	WX				0.000	1.150	.650	CONT.	CONT.
NAVAIR	WX				.260	1.000	.500	CONT.	CONT.
NRL	WX				1.110	.950	.300	CONT.	CONT.
Miscellaneous					1.337	1.701	2.212	CONT.	CONT.
Total					10.960	10.094	10.194		

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-3

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0603790N PROGRAM ELEMENT TITLE: NATO RESEARCH AND DEVELOPMENT
PROJECT NUMBER: 2293 PROJECT TITLE: NATO COOPERATIVE RESEARCH AND DEVELOPMENT (R&D)

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 2008 Budget	FY 2009 Budget	FY 2010 Budget	To Complete	Total Program
Support and Management									

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	FY 2008 Budget	FY 2009 Budget	FY 2010 Budget	To Complete	Total Program
Test and Evaluation									

GOVERNMENT FURNISHED PROPERTY: Not applicable.

	FY 2008 Budget	FY 2009 Budget	FY 2010 Budget	To Complete	Total Program
Subtotal Product Development	10.960	10.094	10.194	CONT.	CONT.
Subtotal Support and Management	0.000	0.000		CONT.	CONT.
Subtotal Test and Evaluation	0.000	0.000		0.000	0.000
Total Project	10.960	10.094	10.194	CONT.	CONT.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION						DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**			R-1 ITEM NOMENCLATURE **0603795N/LAND ATTACK TECHNOLOGY**				
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	49.919	17.971	1.238				
2156 / NAVAL SURFACE FIRE SUPPORT	29.084	3.969	0.000				
2325 / Naval Fires Control System	0.784	1.237	1.238				
9999 / CONGRESSIONAL ADDS	20.051	12.765	0.000				

A. MISSION DESCRIPTION:

A. (U) Mission Description and Budget Item Justification: The Naval Surface Fire Support (NSFS) mission supports the Land Attack Technology program element. To meet the United States Marine Corp (USMC) requirements for NSFS, the Navy will assess projectiles and systems capable of meeting requirements including range, lethality, accuracy, and responsiveness The NSFS program (Project 2156) was developing a 5" Extended Range Munition (ERM) with a coupled Global Positioning System (GPS)/Inertial Navigation System (INS) to be fired from the 5"/62 gun (a modification of the existing 5"/54 gun). FY09 funding is being used to close-out the ERGM contract and perform an Analysis of Alternatives for Joint Expeditionary Fires.

The Naval Fires Control System (NFCS) (Project 2325) automates shipboard land attack battle management duties to be interoperable and consistent with joint C4ISR systems. This shipboard system will significantly improve the Navy's ability to support Operational Maneuver from the Sea (OMFTS).

The 76mm Super Rapid Medium Caliber Gun System Explosives Safety Review (Project 9829A) - The 76mm Super Rapid Gun effort is comprised of an evaluation of both the gun and associated ammunition.

The Affordable Weapons System (AWS) (Project 9359A) - Affordable Weapon System-Program previously funded under Project 9359C to conduct a Phase I Study for an Affordable Weapon System (AWS). Phase I includes mission concept analysis, mission analysis, system architecture analysis, fly-away cost analysis with life cycle cost impacts, and system engineering for a sea-based land attack and strike mission capable precision strike weapon. The proposed system(s) will operate from ships with potential sea-based Navy/Marine Corps aircraft launch and submarine capability of defeating targets at standoff ranges, and can rapidly complete the engagement phase consistent with making the kill chain short. The potential AWS(s) will not exceed $250K in fly-away cost. Phase II was funded to exercise contract options for contractor preferred system concept(s), which will be supported by system engineering, best material approach(es), risk analysis, and future plans, while updating fly-away costs and life cycle impacts.

Modular Advanced Ultra Light Weapons Systems Prototype Mount (Project 9B96A) - To develop lightweight augmentations to current stabilized and potentially crew served small arms systems. Weight on small Navy and combatant crafts is very critical. Current industry methods involving the use of composite materials will help alleviate some of this weight burden on conventional and advance small arms weapon systems being used.

76mm Swarmbuster Capability (Project 9D60A) - To begin efforts to integrate the MK 75 with Close-In Weapons System (CIWS) for ASuW capability against swarming boats.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603795N/LAND ATTACK TECHNOLOGY**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	51.027	40.028	28.627
FY10 President's Budget	49.919	17.971	1.238
Total Adjustments	-1.108	-22.057	-27.389
(U) Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		-0.049	
SBIR/STTR/FTT Assessment	-0.871		
Program Adjustments	-0.237	-21.995	-27.363
Rate/Misc Adjustments		-0.013	-0.026
Total	-1.108	-22.057	-27.389

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CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**				PROJECT NUMBER AND NAME **2156/NAVAL SURFACE FIRE SUPPORT**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	29.084	3.969	$0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The NSFS program developed a 5"/62 gun system (a modification to the existing 5"/54 gun) and a 5" Extended Range Munition (ERM) with a coupled Global Positioning System (GPS) and an Inertial Navigation System (INS). This munition will have the capability to deliver its payload to a range in excess of current conventional ammunition utilizing rocket assisted propulsion with associated propelling charge improvements. In 3Q FY08, a contract modification was initiated to discontinue ERGM System Development and Demonstration (SDD). The SDD phase concluded in 2Q FY08. An Acquisition Decision Memorandum (ADM) was signed by USD (AT&L) on July 25, 2008 for the purpose of terminating the ERM program and conducting future requirements analysis for Joint Fires. The remaining funding in FY08 and FY09 will be used for contract close-out and conducting the required analysis.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**	PROJECT NUMBER AND NAME **2156/NAVAL SURFACE FIRE SUPPORT**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	12.202	0.000	0.000
RDT&E Articles Quantity	0	0	0

Cancellation of ERGM development including component testing, qualification efforts and flight tests. A contract modification for ERGM SDD was implemented in 4Q FY07 to include a 20 round reliability test in 4Q FY08. However, engineering flight tests in 2Q FY08 resulted in a decision to cease the ERGM effort.

	FY 2008	FY 2009	FY 2010
ERM Close-out and Requirement Analysis	16.882	3.969	0.000
RDT&E Articles Quantity	0	0	0

Performed integration testing ERGM System Development and Demonstration (SDD). The remaining funding in FY08 and FY09 will be used for contract close-out and conducting the required analysis.

C. OTHER PROGRAM FUNDING SUMMARY:

Not Applicable at this time due to ERGM cancellation. Supporting program requirements will be re-evaluated as part of the Analysis of Alternatives (AOA).

D. ACQUISITION STRATEGY:

The ERGM program was cancelled. Therefore all qualification testing and Land Based Flight Testing has been suspended. A new AOA is being conducted that will determine program strategy.

E. MAJOR PERFORMERS:

Analysis of Alternative (AOA): Center for Naval Analysis.

Primary Navy Warfare Center: Naval Surface Warfare Center (NSWC) located in Dahlgren, VA. Will provide technical assistance to the PMO supporting the AOA.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**				PROJECT NUMBER AND NAME **2325/Naval Fires Control System**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.784	1.237	1.238				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

A. (U) Mission Description and Budget Item Justification: Naval Fires Control System (NFCS) covers the mission planning and coordination for current and future Naval Surface Fire Support system requirements. NFCS plans, coordinates and manages the firing of Naval Surface Fires Support (NSFS) weapon systems including the 5"/62 caliber gun and Conventional Munitions. The NFCS phase I is interfacing with the Advanced TOMAHAWK Weapons Control Systems (ATWCS) and the Tactical TOMAHAWK Weapons Control Systems (TTWCS) in order for NFCS to share the Advanced Tactical Display Console (ATDC) with ATWCS and TTWCS. Funding provides software and system engineering analysis and development, reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**	PROJECT NUMBER AND NAME **2325/Naval Fires Control System**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Software/System Engineering	0.484	0.737	0.738
RDT&E Articles Quantity	0	0	0

Funding provides software and system engineering analysis and development, reuse and integration of government and commercial computer programs to support extended range munitions and other naval weapon applications.

	FY 2008	FY 2009	FY 2010
Tech Design Agent	0.100	0.100	0.100
RDT&E Articles Quantity	0	0	0

Funding provides Technical Direction Agent support, joint requirements investigation and Concept of Operations (CONOPs) scenario development.

	FY 2008	FY 2009	FY 2010
C4I Systems	0.100	0.100	0.100
RDT&E Articles Quantity	0	0	0

Funding provides C4I and combat system interface investigation and analysis in relation to developing C4I systems and technologies.

	FY 2008	FY 2009	FY 2010
Logistic Support	0.100	0.100	0.100
RDT&E Articles Quantity	0	0	0

Funding supports developmental test and evaluation, and logistics support elements development.

	FY 2008	FY 2009	FY 2010
Operational Development	0.000	0.200	0.200
RDT&E Articles Quantity	0	0	0

Funding supports operational test and evaluation and logistics support elements development.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
O&M, N 14DS0	2.520	2.797	2.818						8.135
OPN BLI 5112	1.371	1.690	1.391						4.452

D. ACQUISITION STRATEGY:

A sole source contract was awarded to GDIS for Phase 1 software development. NSWC/DD took over this function from GDIS and will remain the software developer. The hardware developer is NUWC-KP.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**	PROJECT NUMBER AND NAME **2325/Naval Fires Control System**

E. MAJOR PERFORMERS:

NSWC/DD - Technical Direction Agent, Software Development Agent and Systems Engineering Lead.

NUWC/KP - Hardware Design Agent and Hardware Developer.

NSWC/PHD - Test and Evaluation Agent and Integrated Logistics Support Agent.

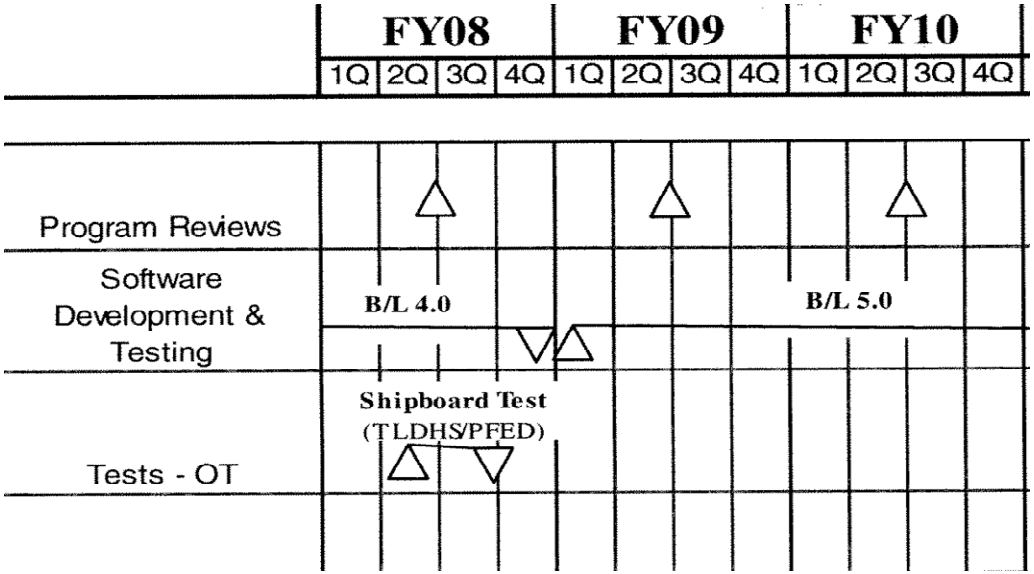
SPAWARSYSCEN, San Diego - Common Operating Environment (COE) and Adjunct Processor Developer.

CLASSIFICATION:		UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**				PROJECT NUMBER AND NAME **2325/Naval Fires Control System**						
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
Primary Software Development	SS/CPAF	GDIS, Arlington, VAQ	25.517			0.000		0.000			25.517	0.000
	SS/CPAF	LM/MDS, Valley Forge, PA	19.079			0.000		0.000			19.079	0.000
	WR/WX	NSWC, Dahlgren, VA	13.787			0.430	NOV-08	0.397	NOV-09		CONT	0.000
	VAR	VARIOUS	1.119			0.000		0.000			1.119	0.000
	WR/WX	SSC/SD	5.085			0.171	NOV-08	0.171	NOV-09		5.427	0.000
Systems Engineering	WR	SSC/SD	2.951			0.000		0.000			2.951	0.000
	WR/WX	NSWC, Dahlgren, VA	18.448			0.100	NOV-08	0.134	NOV-09		18.682	0.000
	SS/CP	VITRO/BAE	0.670			0.000		0.000			0.670	0.000
	VAR	VARIOUS	1.304			0.000		0.000			1.304	0.000
Ancillary Hardware Development	WR/WX	NUWC, Keyport Division	11.058			0.000		0.000			11.058	0.000
	WR/WX	NSWC, PT HUE., CA	5.735			0.000		0.000			5.735	0.000
	VAR	PMFATDS	3.576			0.000		0.000			3.576	0.000
	SS/CPAF	JHU/APL	1.362			0.000		0.000			1.362	0.000
	SS/CPFF	JHU/APL	0.121			0.000		0.000			0.121	0.000
	WR	NSWC, Dahlgren, VA	2.236			0.000		0.000			2.236	0.000
LAM FC Hardware/Software Dev	SS/CPFF	LM/Baltimore, MD	4.181			0.000		0.000			4.181	0.000
TERMINATED	SS/CPAF	LM/MDS, Valley Forge, PA	12.131			0.000		0.000			12.131	0.000
	SS/CPFF	UDLP	0.455			0.000		0.000			0.455	0.000
	WR	NSWC, Dahlgren, VA	1.162			0.000		0.000			1.162	0.000
	WR	SSC/SD	0.486			0.000		0.000			0.486	0.000
LAM FC Systems Engineering	SS/CPFF	JHU/APL	0.386			0.000		0.000			0.386	0.000
TERMINATED	WR	NSWC, PT HUE., CA	0.361			0.000		0.000			0.361	0.000
Award Fees			3.979			0.000		0.000			3.979	0.000
Ancillary Hardware Dev	VAR	VARIOUS	1.541			0.000		0.000			1.541	0.000
Subtotal Product Development			**136.730**			**0.701**		**0.702**			**CONT**	**0.000**
Remarks:												
Software Development		NSWC, Panama City	0.049			0.000		0.000			0.049	0.000
Training Development	VAR	VARIOUS	0.487			0.000		0.000			0.487	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**				PROJECT NUMBER AND NAME **2325/Naval Fires Control System**						
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
Integrated Logistics Support	VAR	VARIOUS	5.455			0.100	OCT-08	0.100	OCT-09		5.655	0.000
Subtotal Support Costs			**5.991**			**0.100**		**0.100**			**6.191**	**0.000**
Remarks:												
Developmental Test & Eval	WR/WX	NSWC, PT HUE., CA	6.277			0.100	OCT-08	0.100	OCT-09		6.477	0.000
	VAR	VARIOUS	1.500			0.000		0.000			1.500	0.000
Operational Test & Eval	VAR	VARIOUS	5.508			0.200	OCT-08	0.200	OCT-09		5.908	0.000
Subtotal Test and Evaluation			**13.285**			**0.300**		**0.300**			**13.885**	**0.000**
Remarks:												
Program Management Spt	VAR	VARIOUS	5.333			0.106	OCT-08	0.106	OCT-09		5.545	0.000
TRAVEL	PD	NAVSEA HQ	0.545			0.030	OCT-08	0.030	OCT-09		0.605	0.000
			0.000			0.000		0.000			0.000	0.000
Subtotal Management Services			**5.878**			**0.136**		**0.136**			**6.150**	**0.000**
Remarks:												
Total Cost			**161.884**			**1.237**		**1.238**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**	PROJECT NUMBER AND NAME **2325/Naval Fires Control System**

Naval Fires Control System (NFCS) Phase I/II



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**			PROJECT NUMBER AND NAME **2325/Naval Fires Control System**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Naval Fires Control System (NFCS) Phase I/II							
FOT&E #1 (TLDHS & PFED)	2Q-3Q						
Software Development & Testing B/L 4.0	1Q-4Q						
Software Development & Testing B/L 5.0		1Q-4Q	1Q-4Q				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603795N/LAND ATTACK TECHNOLOGY**	PROJECT NUMBER AND NAME **9999/CONGRESSIONAL ADDS**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	20.051	12.765	0.000
RDT&E Articles Quantity	0	0	0

Project 9359A

Affordable Weapons System - FY08 $14,653K; FY09 $11,169K

Program previously funded under Project 9359C to conduct a Phase I Study for an Affordable Weapon System (AWS). Phase I includes mission concept analysis, mission analysis, system architecture analysis, fly-away cost analysis with life cycle cost impacts, and system engineering for a sea-based land attack and strike mission capable precision strike weapon. The proposed system(s) will operate from ships with potential sea-based Navy/Marine Corps aircraft launch and submarine capability of defeating targets at standoff ranges, and can rapidly complete the engagement phase consistent with making the kill chain short. The potential AWS(s) will not exceed $250K in fly-away cost. FY08 funding will be used to exercise AWS Phase II Study contract options for contractor preferred system concept(s), which will be supported by system engineering, best material approach(es), risk analysis, and future plans, while updating fly-away costs and life cycle impacts for potential Milestone "A" start into System Development & Demonstration (SDD).

Project 9B96A

Modular Advanced Ultra Light Weapons Systems Prototype Mount - FY08 $3,855K

To develop lightweight augmentations to current stabilized and potentially crew served small arms systems. Weight on small Navy Combatant crafts is very critical. Current industry methods involving the use of composite materials will help alleviate some of this weight burden on conventional and advance small arms weapon systems being used.

Project 9829A

76mm Super Rapid Medium Caliber Gun System Explosives Safety Review - FY08 $1,543K

To test and evaluate the 76mm Super Rapid Gun Mount (SRGM) using current Navy inventory ammunition. The results from these tests will be provided to the Weapon System Explosive Safety Review Board (WSESRB) for qualification of the 76mm SRGM. Specifically, safety assessment testing of the gun and ammunition will be completed 1st quarter FY09 followed by a WSESRB meeting 2nd quarter FY09. Plans include the conduct of mount serviceability and range table testing, electromagnetic vulnerability followed by analysis of test results.

Project 9D60A

76mm Swarmbuster Capability - FY09 $1,596K

To begin efforts to integrate the MK 75 with Close-In Weapons System (CIWS) for ASuW capability against swarming boats.

EXHIBIT R-2, RDT&E Budget Item Justification				DATE: May 2009				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration and Validation**	PROGRAM ELEMENT (PE) NAME AND NO. **0603851M Non-Lethal Warfare Demonstration and Validation**							
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
Total PE Cost	**56.459**	**49.150**	**46.971**	**0.000**	**46.971**			
C2319 Non-Lethal Weapons	**55.494**	**46.757**	**46.971**	**0.000**	**46.971**			
C9B97A Congressional Add	**0.965**	**0.000**	**0.000**	**0.000**	**0.000**			
9878A Congressional Add	**0.000**	**2.393**	**0.000**	**0.000**	**0.000**			
Quantity of RDT&E Articles								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The DoDs Joint Non-Lethal Weapons Program (JNLWP) was established by the Secretary of Defense, who assigned centralized responsibility for DoD joint research and development of non-lethal weapons and technology to the Commandant of the Marine Corps as the Executive Agent. The Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L) provides direct oversight of the JNLWP.

The efforts described in this Program Element (PE) reflect Joint Service research and development (R&D) investment decisions provided by the Joint NLW Integrated Product Team, a multi-service flag level corporate board that executes the JNLWP for the Commandant of the Marine Corps. Research conducted is based on the needs and capabilities of the Services, the Special Operations Command, and the Coast Guard, as identified in the DoDs Non-Lethal Weapons Joint Capabilities Document. This coordinated joint R&D development approach addresses mutual capability gaps and assures the best non-lethal technologies and equipment are provided to the operating forces while eliminating duplicative Service investment.

This program funds Joint Service research, development, test and evaluation of non-lethal weapon (NLW) systems and technologies that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. Instead, these systems are designed to stun, incapacitate, or hinder movement of individuals, crowds, or equipment. The availability of NLWs allows commanders less than lethal options, particularly in urban warfare and military operations other than war, i.e., peacekeeping, humanitarian assistance and disaster relief, as well as special operations.

B. PROGRAM CHANGE SUMMARY:

	FY2008	FY2009	FY2010
Funding:			
FY 2009 President's Budget:	47.876	46.902	47.617
FY 2010 President's Budget:	56.459	49.150	46.971
Total Adjustments:	8.583	2.248	-0.646
Summary of Adjustments:			
a. Congressional Adjustments:		2.248	
- FY08 GWOT:	6.451		
b. SBIR/STTR Transfer:	-0.378		
c. Program Adjustments:	2.510		
d. Rate/Misc Adjustments:	0.000		-0.646
Subtotal	8.583	0	-0.646

EXHIBIT R-2a, RDT&E Project Justification					DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Adv Comp Dev & Prototypes**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare DEM/VAL**				PROJECT NUMBER AND NAME **C2319 Non-Lethal Weapons Program**			
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
Project Cost	**55.494**	**46.757**	**46.971**	**0.000**	**46.971**			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops non-lethal weapon (NLW) systems that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. Instead, these systems are designed to stun, incapacitate, or hinder movement of individuals, crowds, or equipment. The availability of NLWs allows commanders less than lethal options, particularly in urban warfare and military operations other than war, i.e., peacekeeping, humanitarian assistance and disaster relief, as well as special operations.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**2.625**	**3.393**	**3.563**	
RDT&E Articles Qty				

Execution oversight, administration and support of the Joint NLW Program and technologies database.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**1.125**	**1.357**	**1.402**	
RDT&E Articles Qty				

Evaluation of NLWs by Service warfighting laboratories and Joint Forces Command (JFCOM) for direct user feedback of various non-lethal (NL) technologies and munitions.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**1.305**	**1.379**	**1.101**	
RDT&E Articles Qty				

Modeling and simulation (M&S) of NLWs in warfighter training/war gaming models and performance effects data collection/population to demonstrate/analyze NL effects and optimize training.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.248**	**0.118**	**0.000**	
RDT&E Articles Qty				

Pursuit of new technology through open competition of industry, academia and government laboratory sources for NL capabilities.

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**2.345**	**3.000**	**2.600**	
RDT&E Articles Qty				

Airburst Non-Lethal Munition (formerly known as Objective Individual Combat Weapons (OICW)) – Continue development of NL munitions for the “next generation” 25mm combat weapon to exploit air-burst munitions with NL payloads at longer ranges with existing systems.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Adv Comp Dev & Prototypes**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare DEM/VAL**		PROJECT NUMBER AND NAME **C2319 Non-Lethal Weapons Program**	
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**2.400**	**2.055**	**2.125**	
RDT&E Articles Qty				
Program support for each service's coordination and participation in the Joint NLW Program.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.770**	**0.000**	**0.000**	
RDT&E Articles Qty				
Mk19 NL Munition - Development of a NL munition for the 40mm Mk19 Grenade Machine Gun.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**4.000**	**5.150**	**1.000**	
RDT&E Articles Qty				
Active Denial Technology (ADT) Transition - efforts continue maturation of active denial technologies in preparation for transition to joint acquisition programs of record. Changes between FY10 and FY11 capture solid state ADT transitions from Advanced Technology Development to higher levels of research and development.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**6.260**	**0.000**	**0.000**	
RDT&E Articles Qty				
Continue risk reduction efforts to reduce cost, size and weight of active denial technology to meet operational user requirements for a joint active denial system. Initiate efforts to integrate active denial technology into a Mine Resistant Ambush Protected (MRAP) vehicle.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**5.044**	**0.000**	**0.000**	
RDT&E Articles Qty				
Funds provided from the Joint Rapid Acquisition Cell for activities associated with preparing the Active Denial System 2 for an operational deployment in response to a joint urgent operational need statement (JUONS).				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.000**	**0.500**	**0.500**	
RDT&E Articles Qty				
Distributed Sound and Light Array (DSLA) - Multi-sensory counter-personnel research on non-lethal acoustical/optical weapons for use as a hail and warning device.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**6.045**	**6.031**	**6.031**	
RDT&E Articles Qty				
Studies and Analysis – Medical and NL casualty data research and collection; human effects assessments; acceptability analysis; and technical studies/analysis of emerging technologies for possible NL application.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**10.030**	**11.086**	**17.523**	
RDT&E Articles Qty				
The advanced development of emerging technologies into the acquisition process to satisfy critical joint mission tasks. Increases to this line item represent maturing technology transitions from advanced technology development efforts.				

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Adv Comp Dev & Prototypes**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare DEM/VAL**		PROJECT NUMBER AND NAME **C2319 Non-Lethal Weapons Program**	
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**7.925**	**7.062**	**7.390**	
RDT&E Articles Qty				
System development and design of technology development downselected items to proceed into the acquisition cycle to provide NL technology solutions to critical joint mission tasks.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**1.579**	**1.026**	**1.036**	
RDT&E Articles Qty				
Develop/expand the NATO Measures of Effectives (MOE) efforts, chaired by the U.S. to provide input for Defense Capabilities Initiative (DCI) and NATO assessment of NLW in the Defense planning process. Expanded interaction with component commander (COCOM) staffs to identify emerging NLW capabilities and their utility in theater operations and Homeland Security missions.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**1.888**	**3.800**	**2.000**	
RDT&E Articles Qty				
Mission Payload Module Non Lethal Weapon System (formerly TUGV) - Development of a tube launched NL munition for integration on HMMWVs, tactical vehicles, boats and ships, with a range of 30-150 meters (T) and 10 - 500 meters (O). Mission Payload Module (MPM) will provide an improved Non-Lethal (NL) capability applicable to controlling crowds, denying/defending areas, controlling access and engaging threats while providing increased standoff for protection of friendly forces. The weapons platform will provide greater range, area coverage, duration of effects, selectability, and scalability for these non-lethal effects than current NLW systems. The first increment of MPM will be mounted on the High Mobility Multipurpose Wheeled Vehicle (HMMWV) or its replacement.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**1.105**	**0.000**	**0.000**	
RDT&E Articles Qty				
Vehicle Lightweight Arresting Device (VLAD) - Accelerated development and acquisition of a man-portable, pre-emplaced spiked net vehicle stopper.				
COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.800**	**0.800**	**0.700**	
RDT&E Articles Qty				
Joint Integration Program (JIP) - Select and test newly developed commercial products that May meet the Joint Services' requirements for specific NL capability set common items.				
(U) Total $	**55.494**	**46.757**	**46.971**	

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	**FY 2008**	**FY 2009**	**FY 2010**
(U) Related RDT&E:			
(U) RDT&E, PE: 0206623M, Project: C1901, Mission Payload Module	3.913		

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Adv Comp Dev & Prototypes**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare DEM/VAL**	PROJECT NUMBER AND NAME **C2319 Non-Lethal Weapons Program**

(U) D. ACQUISITION STRATEGY:

The JNLW Program strategy is to continue to pursue the fielding of NLW systems through modifying Commercial-Off-The-Shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in modeling and simulation, experimentation, and state-of-the-art technology investment. The acquisition strategy for each weapon system is largely Lead Service dependent. The JNLWP provides RDT&E funding while the Services are responsible for procurement and operations and maintenance funding. For complex development programs, such as directed energy research, JNLWP RDT&E funds will augment Service RDT&E funding in support of joint applications.

(U) E. MAJOR PERFORMERS:

(U) SCHEDULE PROFILE: Not Applicable.

Exhibit R-3 Cost Analysis									DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Adv Comp Dev & Prototypes**		PROGRAM ELEMENT **0603851M Non-Lethal Warfare DEM/VAL**				PROJECT NUMBER AND NAME **C2319 Non-Lethal Weapons Program**								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Product Development	MIPR	ARDEC, Picatinny, NJ	19.813	5.567	10/07	5.108	10/08	5.200	Various					
Product Development	MIPR	SOCOM, McDill AFB, FL	8.856			1.785	10/08	1.580	Various					
Product Development	WR	NSWC, Various	10.877	0.936	Various	2.000	Various	2.500	Various					
Product Development	MIPR	Eglin AFB, FL	0.000	9.260	Various	4.355	Various	1.849	Various					
Product Development	MIPR	Kirtland AFB, NM	18.061	1.000	12/07	1.000	Various	1.000	Various					
Product Development	MIPR	Brooks AFB, TX	19.744	6.120	02/08	6.220	02/09	6.500	Various					
Product Development	MIPR	JWCF, Ft. Monroe, VA	9.736	1.112	02/08	1.309	02/09							
Product Development	WR/RCP	MCSC, Quantico,VA	12.350	1.437	Various	2.000	Various	0.350	Various					
Product Development	MIPR	NSMA,Arlington, VA	14.796	3.202	01/08	4.000	01/09	2.000	01/10					
Product Development	CPFF	MCLB, Albany,GA	8.316											
Product Development	MIPR	Various - M&S	11.061	1.730	Various	1.851	Various	1.101	Various					
Product Development	MIPR	Various - JIP	9.612	0.800	Various	0.800	Various	0.700	Various					
Product Development	Various	Var (Uniformed Svcs)	32.419	19.678	Various	11.444	Various	21.412	Various					
Subtotal Product Dev			**175.641**	**50.842**		**41.872**		**44.192**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Support Cost	WR	MCSC, Quantico, VA	9.216	0.500	11/07	0.500	11/08	0.318	Various					
Support Cost	WR	NSWC, Dahlgren, VA	9.196	0.470	10/07	0.710	10/08	1.311	Various					
Support Cost	Various	Various	22.608	3.143	Various	3.375	Various	0.650	Various					
Subtotal Support			**41.020**	**4.113**		**4.585**		**2.279**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
T&E Cost - MPM	RCP	Various	1.714	0.539	Various	0.300	Various	0.500	Various					
Subtotal T&E			**1.714**	**0.539**		**0.300**		**0.500**						
Remarks:														
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Management														
Subtotal Management			**0.000**	**0.000**		**0.000**		**0.000**						
Remarks:														
Total Cost			**218.375**	**55.494**		**46.757**		**46.971**						

Exhibit R-4-4a Project Schedule/Detail		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N /BA-4 Adv Comp Dev & Prototypes	**0603851M Non-Lethal Warfare DEM/VAL**	**C2319 Non-Lethal Weapons Program**

(U) D. SCHEDULE PROFILE:

Airburst Non-Lethal Munition (ANLM)

MS A:	3rd Qtr, FY2003
MS B:	4th Qtr, FY2008
DT / OT:	4th Qtr, FY 2010

Active Denial System (ADS)

ACTD Approved:	3rd Qtr, FY2002
MS A:	4th Qtr, FY 2009

Mission Payload Module

MS B	1st Qtr, FY 2009	Contract Award:	2nd Qtr, FY 2009 (for SD&D)
CDD Approval	1st Qtr, FY 2008		
Market Research/Evaluation	4th Qtr, FY 2008		
Contractor Design/Test	3rd Qtr, FY 2009		

The development of new technology NLW systems are in various stages of acquisition and the acquisition strategy for each weapon system is largely dependent on the Lead Service.

Program Funding Summary (APPN, BLI #, NOMEN)	**FY 2008**	**FY 2009**	**FY 2010**	**FY2010 OCO**	**FY2010 Total**
(U) RDT&E,N	55.494	46.757	46.971	0.000	46.971

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration and Validation**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare Dem/Val**		PROJECT NUMBER AND NAME **C9878A Boat Trap Sys For Port Secrty/Water Craft Interdiction**					
COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
C9999 Congressional Adds	**0.000**	**2.393**	**0.000**	**0.000**	**0.000**			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops non-lethal weapon (NLW) systems that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. As identified in the Non-Lethal Effects Joint Capabilities Document, the ability to non-lethally stop vessels is a top capability gap identified by the Services.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.000**	**2.393**	**0.000**	
RDT&E Articles Qty				

This Congressional plus-up is intended to advance technology to broaden the boat trap system effectiveness against several threat water-crafts

(U) Total $	**0.000**	**2.393**	**0.000**

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	**FY 2008**	**FY 2009**	**FY 2010**	**FY2010 OCO**
(U) Related RDT&E:				
(U) RDT&E PE 0603851M, Project C2319, NL Warfare Dem/Val	55.494	46.757	46.971	0.000

(U) D. ACQUISITION STRATEGY:

The JNLW Program strategy is to continue to pursue the fielding of NLW systems through modifying Commercial-Off-The-Shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in modeling and simulation, experimentation, and state-of-the-art technology investment. The acquisition strategy for each weapon system is largely Lead Service dependent. The JNLWP provides RDT&E funding while the Services are responsible for procurement and operations and maintenance funding. For complex development programs, such as directed energy research, JNLWP RDT&E funds will augment Service RDT&E funding in support of joint applications.

(U) E. MAJOR PERFORMERS:

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-4 Demonstration and Validation**	PROGRAM ELEMENT NUMBER AND NAME **0603851M Non-Lethal Warfare Dem/Val**	PROJECT NUMBER AND NAME **C9B97A Cong/High Power Micro Sys Vehicle Immobilization**	

COST ($ in Millions)	FY 2008	FY 2009	FY2010	FY2010 OCO	FY2010 Total			
C9999 Congressional Adds	**0.965**	**0.000**	**0.000**	**0.000**	**0.000**			
RDT&E Articles Qty								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This project develops non-lethal weapon (NLW) systems that by their design, provide a new non-lethal capability to minimize fatal or permanent injuries and undesired damage to property and the environment. As identified in the Non-Lethal Effects Joint Capabilities Document, the ability to non-lethally stop vehicles is the top capability gap as identified by the Services.

(U) B. ACCOMPLISHMENTS/PLANNED PROGRAM:

COST ($ in Millions)	FY 2008	FY 2009	FY 2010	
Accomplishment/Effort Subtotal Cost	**0.965**	**0.000**	**0.000**	
RDT&E Articles Qty				

This Congressional plus-up is intended to advance technology to further develop high-power microwave systems for vehicle immobilization. The Service requirement for this item is based on the need to combat vehicle borne improvised explosive devices without causing harm to innocent civilians or their vehicles.

(U) Total $	**0.965**	**0.000**	**0.000**

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

	FY 2008	**FY 2009**	**FY 2010**	**FY2010 OCO**
(U) Related RDT&E:				
(U) RDT&E PE 0603851M, Project C2319, NL Warfare Dem/Val	55.494	46.757	46.971	0.000

(U) D. ACQUISITION STRATEGY:

The JNLW Program strategy is to continue to pursue the fielding of NLW systems through modifying Commercial-Off-The-Shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in modeling and simulation, experimentation, and state-of-the-art technology investment. The acquisition strategy for each weapon system is largely Lead Service dependent. The JNLWP provides RDT&E funding while the Services are responsible for procurement and operations and maintenance funding. For complex development programs, such as directed energy research, JNLWP RDT&E funds will augment Service RDT&E funding in support of joint applications.

(U) E. MAJOR PERFORMERS:

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE **0603860N - JPALS**			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**66.789**	**76.822**	**150.304**					
2329 Joint Precision Approach and Landing System INC 1A	66.789	76.822	139.304					-
3228 Joint Precision Approach and Landing System INC 1B			11.000					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program element provides for the development, integration, and testing of the Joint Precision Approach and Landing System (JPALS), which will be applicable to Department of Defense (DoD) Ground systems, DoD aircraft, and Navy and Coast Guard air capable surface ships. JPALS will provide a rapidly deployable, adverse weather, adverse terrain, day-night precision approach and landing capability. Operating environments include fixed or permanent ground facilities, tactical facilities, and shipboard. JPALS will be interoperable with civil landing systems. The JPALS program was established in response to the Joint Mission Need Statement (MNS) for Precision Approach and Landing Capability (PALC), which was approved by the Chief of Naval Operations on 28 July 1994 and the Chief of Staff of the Air Force on 8 August 1994. The PALC MNS was validated by the Joint Requirements Oversight Council (JROC) on 29 August 1995. Army Joint Service participation was included in the 28 May 1996 Principal Deputy Under Secretary of Defense (Acquisition and Technology) Milestone 0 Acquisition Decision Memorandum (ADM), which also designated the Air Force as the Lead Service. In March 2004, the JPALS Overarching Integrated Program Team (OIPT) determined that the MNS should be converted to an Initial Capabilities Document (ICD). The JPALS ICD was approved by the JROC on 19 September 2005. On 21 July 2007 JROCM approved the JPALS Capability Development Document (CDD) and designated the Navy as the Lead Service. The Analysis of Alternatives (AoA) was finalized in 3Q FY 2007.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**	R-1 ITEM NOMENCLATURE **0603860N - JPALS**

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	69.298	99.929	106.407
FY 10 President's Budget	66.789	76.822	150.304
Total Adjustments	-2.509	-23.107	43.897
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		-22.897	
SBIR/STTR/FTT Assessments	-0.216		
Program Adjustments	-2.293		43.910
Rate/Misc Adjustments		-0.210	-0.013
Subtotal	-2.509	-23.107	43.897

Schedule:

The JPALS program Defense Acquisition Board (DAB) review did not occur as displayed in PB09. Originally scheduled for 13 February 2008, the DAB review was moved to 9 April, 2008 because of OSD (AT&L) staff scheduling conflicts. A successful DAB occurred on 27 June 2008 , the Acquisition Decision Memorandum (ADM) was signed on 14 July 2008 and the SDD contract was awarded 17 July 2008. Because of the delayed DAB and contract award, several scheduled program events and milestones have now slipped by one quarter. Integration data has been added to the schedule to show Trade Studies, Design-Build-Test activities and Production Installs for the F/A-18, E/A-18G, MH-60R, MH-60S and Flight Test & CV Cert and OT&E for the JSF. JPALS INC 1B MS B moved to 1st quarter FY 2011 to coincide with JPALS INC 1A CDR.

Technical:

PE 0603860N was split into two project units; JPALS 1A and JPALS 1B, (see separate R-2A) to allow for more accurate ACAT reporting.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603860N - Joint Precision Approach and Landing System INC 1A				PROJECT NUMBER AND NAME 2329 - JPALS INC 1A			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**66.789**	**76.822**	**139.304**					
RDT&E Articles Qty			**1**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. This effort includes the build and test of Ship Global Positioning System/Inertial Navigation System (GPS/INS) based precision approach and landing systems to replace obsolete SPN-46, SPN-35 Systems. Additionally, this requirement supports the JPALS Integration on Amphibious ships and DDG class ships (TACAN Replacement) and provides critical enabling technology for Joint Strike Fighter and Navy Unmanned Combat Air System (UCAS).

One JPALS Land and Ship based Engineering Development Model (EDM) test article will be delivered in FY 2010 to support system development and demonstration. User listed below:

FY10 - 1 unit for CTR Ship Integration Lab (SIL)

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603860N - Joint Precision Approach and Landing Syste	2329 - JPALS INC 1A

B. Accomplishments/Planned Program

JPALS Technology Development	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	11.430			
RDT&E Articles Quantity				

Complete technology maturation and risk reduction tasks via use of Broad Area Announcements (BAA) contracts in support of Technology Development phase. Tasks include supporting documentation and presentation requirements in support of the pre-Milestone B Technology Readiness Assessment process, and pre-SDD ship and aircraft integration studies and reports. Additionally, funding supports preparing documentation to support Milestone B, developing an SDD contract solicitation package for release to industry (including the System Requiremen Document), and supporting all NAVAIR pre-contract solicitation reviews and boards.

JPALS SDD Increment 1A - Shipboard	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	54.089	72.752	134.471	
RDT&E Articles Quantity			1	

JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. This effort includes the build and test of Ship Global Positioning System/Inertial Navigation System (GPS/INS) based precision approach and landing systems to replace obsolete SPN-46, SPN-35 Systems. Additionally, this requirement supports the JPALS Integration on Amphibious ships and DDG class ships (TACAN Replacement) and provides critical enabling technology for Joint Strike Fighter and Navy Unmanned Combat Air System (UCAS).

JPALS SDD Increment Aircraft Integration Guide	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.270	4.070	4.833	
RDT&E Articles Quantity				

Air Integration Guide is a principle deliverable of the JPALS SDD contract. This guide will serve as the integration document for air platforms

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603860N - Joint Precision Approach and Landing Syster	2329 - JPALS INC 1A

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

N/A

D. ACQUISITION STRATEGY:

Technology Development (TD) phase was conducted jointly by NAVAIRSYSCOM (PMA213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 SDD phase development. In March 2007, overall joint program leadership transferred from the USAF to the USN. The JPALS 1A phase reached MSB on 27 June 2008 and the SDD phase development contract was awarded on 17 July 2008 and tasking consists of seabased JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products to the joint team. The SDD contact was decided after full and open competition. Future procurement of airborne systems will consist of modifications to Original Equipment Manufacture (OEM) aircraft integration and to existing avionics. Seabased JPALS will be developed by the Navy with government owned or non-proprietary algorithms to an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. Air Force POM 08 results deferred Air Force funding and development of land based Increment 2 to POM 10. As Lead Service, the Navy will manage the Joint Program to develop all JPALS increments. An updated JPALS Acquisition Strategy separates Increment 1 into two Increments (Inc 1A & Inc 1B). JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. Additionally, this requirement supports the JPALS Integration on Amphibious ships and DDG class ships and provides critical enabling technology for Joint Strike Fighter and Navy UCAS. JPALS Increment 1B provides for integration and testing into the avionics of F/A - 18E/F, EA-18G, and MH-60R. This is the first phase of the carrier airwing (CVW) integration to JPALS. This second phase of aircraft integration provides JPALS capable aircraft for CVN-79 work-ups and deployment.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603860N - Joint Precision Approach and Landing System			PROJECT NUMBER AND NAME 2329 - JPALS INC 1A						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	C/CPAF/IF	Various	36.637	42.176	01/09	78.882	11/09					
Aircraft Integration - Non Specific	Var	Var	0.280	0.364	12/08	0.479	12/09					
Aircraft Integration - F/A-18 E/F/G	SS/CPAF	Boeing, Herndon, VA	0.440	1.513	12/08	2.323	12/09					
Aircraft Integration - MH60 R/S	SS/CPAF	Lockheed Martin, Manassas	0.860	1.009	12/08	1.549	12/09					
Aircraft Integration - Systems Eng	WX	NAWCAD Pax River	0.593	1.182	12/08	15.831	12/09					
Ship Integration	WX	NAWCAD Pax River	8.007	4.441	12/08	5.471	12/09					
Award fee	C/CPAF/IF	Various	1.638	2.934	08/09	4.584	08/10					
Primary Hardware Development-TD	Var	Var	105.504									
Subtotal Product Development			153.959	53.619		109.119						

Remarks: Conducts non-recurring engineering efforts under the SDD contract including requirements identification. Conducts System Requirements Review, System Function Review, Preliminary Design Review and Integrated Baseline Review under the SDD contract. Begins airwing integration to support CVN-21 efforts. Target Value listed for SDD contract is based on latest Program Office Estimate.

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Development Support	VAR	VAR	21.514									
System Eng Support - SDD	VAR	VAR		7.726	12/08	7.881	12/09					
Integrated Logistics Support	WX	NAWCAD Patuxent River	4.505	1.449	12/08	1.478	12/09					
Subtotal Support			26.019	9.175		9.359						

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603860N - Joint Precision Approach and Landing System			PROJECT NUMBER AND NAME 2329 - JPALS INC 1A						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	WX	NAWCAD Patuxent River	6.496	2.876	12/08	9.451	12/09					
Operational Test & Evaluation	WX	COMOPTEVFOR NFLK, VA	0.566	0.373	12/08	0.381	12/09					
Subtotal T&E			7.062	3.249		9.832						
Remarks: DT focuses on SDD phase test documentation planning and test range coordination. Develops DT test cases. Monitoring of SDD contractor system integration build up. Operational test activities include test and evaluation master plan requirements into test cases.												
Government Engineering Support	WR	NAWCAD, Patuxent River	16.399	7.947	12/08	8.106	12/09					
Program Management Supp -Cost	WX	NAWCAD, Patuxent River	6.007	1.000	12/08	1.000	12/09					
PM Support MSS	CPFF	AMELEX, California, MD	3.325	1.326	12/08	1.372	12/09					
Travel	WX	NAVAIR	0.896	0.506	12/08	0.516	12/09					
Subtotal Management			26.627	10.779		10.994						
Remarks: Tasking includes execution of SDD contract activities, coordination of Prime Mission Product and support contractor activities, coordination with other USN aircraft and ship program offices, development of ship installation drawings, and non-recurring engineering support.												
Total Cost			213.667	76.822		139.304						
Remarks:												

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603860N, JPALS	2329 - JPALS INC 1A

Fiscal Year	2008				2009				2010			
	O N D	J F M	A M J	J A S	O N D	J F M	A M J	J A S	O N D	J F M	A M J	J A S
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones			MS B									
INC 1A			▲									
Technology Development	■											
System Development & Demo				■	■	■	■					
Development									PDR △			AIG △
EDM Delivery											△1	
Integration JSF												
Test & Evaluation Milestones												
Integrated Test/Operational Test												
Production Milestones												

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603860N, JPALS				PROJECT NUMBER AND NAME 2329- JPALS INC 1A			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Increment 1A								
Technology Development Phase	1Q							
System Development and Demonstration	4Q	1-4Q	1Q-4Q					
Milestone B (MS B)	3Q							
Preliminary Design Review			1Q					
Critical Design Review								
AIG Del			4Q					
EDM 1 Delivery			3Q					

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603860N - Joint Precision Approach and Landing System				PROJECT NUMBER AND NAME 3228 - JPALS INC 1B			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost			**11.000**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The JPALS Acquisition Strategy separates JPALS into two Increments sharing the same PE. JPALS Increment 1A provides for development , integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. JPALS Increment 1B, beginning in FY-10, provides for integration and testing into the avionics of F/A -18E/F, EA-18G, and MH-60R. This is the first phase of the carrier air wing (CVW) integration to JPALS.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA4	0603860N - Joint Precision Approach and Landing Syste	3228 - JPALS INC 1B

B. Accomplishments/Planned Program

Fixed Wing Integration	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	11.000	
RDT&E Articles Quantity				

This effort includes development, integration, installation, and testing of the F/A-18E/F and EA-18G. This provides the Navy with fixed wing aircraft which are JPALS capable in FY-15 and out. This is the first phase of the carrier air wing (CVW) integration to JPALS.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603860N - Joint Precision Approach and Landing Syster	3228 - JPALS INC 1B

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name

N/A

D. ACQUISITION STRATEGY:

Technology Development (TD) phase was conducted jointly by NAVAIRSYSCOM (PMA213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 SDD phase development. In March 2007, overall joint program leadership transferred from the USAF to the USN. The JPALS 1A phase reached MSB on 27 June 2008 and the SDD phase development contract was awarded on 17 July 2008 and tasking consists of seabased JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products to the joint team. The SDD contact was decided after full and open competition. Future procurement of airborne systems will consist of modifications to Original Equipment Manufacture (OEM) aircraft integration and to existing avionics. Seabased JPALS will be developed by the Navy with government owned or non-proprietary algorithms to an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. Air Force POM 08 results deferred Air Force funding and development of land based Increment 2 to POM 10. As Lead Service, the Navy will manage the Joint Program to develop all JPALS increments. An updated JPALS Acquisition Strategy separates Increment 1 into two Increments (In 1A & Inc 1B). JPALS Increment 1A provides for development, integration, installation, and test of Sea-Based JPALS to meet IOC of CVN. Additionally, this requirement supports the JPALS Integration on LH and DDG class ships and provides critical enabling technology for Joint Strike Fighter and Navy UCAS. JPALS Increment 1B provides for integration and testing into the avionics of F/A -18E/F, EA-18G, and MH-60R. This is the first phase of the carrier airwing (CVW) integration to JPALS. This second phase of aircraft integration provides JPALS capable aircraft for CVN-79 work-ups and deployment.

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0603860N - Joint Precision Approach and Landing System			PROJECT NUMBER AND NAME 3228 - JPALS INC 1B						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Aircraft Integration - Non Specific	Var	Var				3.889	12/09					
Aircraft Integration - F/A-18 E/F/G	SS/CPAF	Boeing, Herndon, VA				5.745	12/09					
Subtotal Product Development			0.000	0.000		9.634						

Remarks: Conducts non-recurring engineering efforts under the SDD contract including requirements identification. Conducts System Requirements Review, System Function Review, Preliminary Design Review and Integrated Baseline Review under the SDD contract. Begins airwing integration to support CVN-21 efforts.

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Integrated Logistics Support	WX	NAWCAD Patuxent River				0.357	12/09					
Subtotal Support			0.000	0.000		0.357						

R-1 SHOPPING LIST - Item No. 71

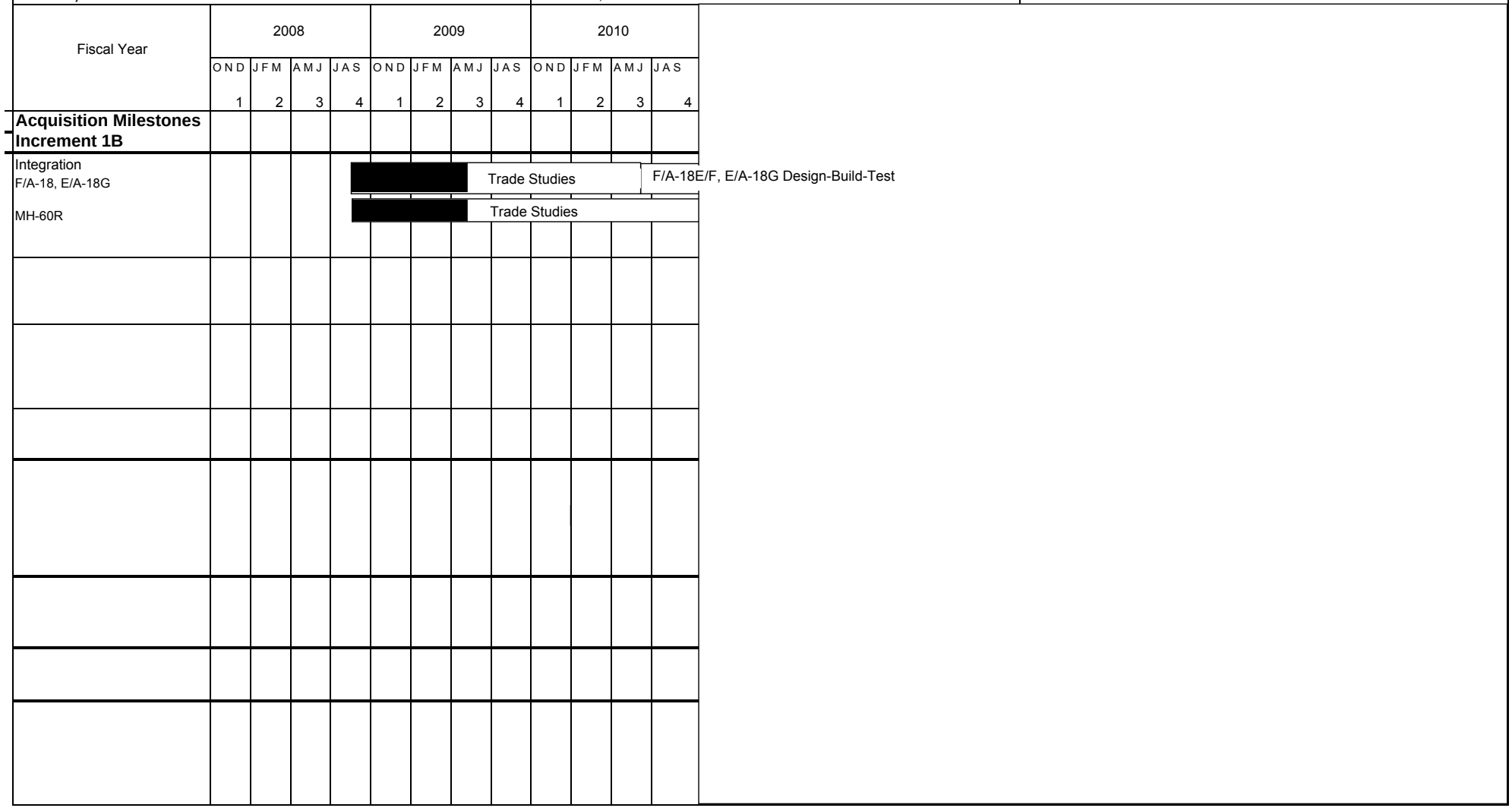
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0603860N - Joint Precision Approach and Landing System			PROJECT NUMBER AND NAME 3228 - JPALS INC 1B						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date				
Developmental Test & Evaluation	WX	NAWCAD Patuxent River				0.652	12/09				
Subtotal T&E			0.000	0.000		0.652					
Remarks: DT focuses on SDD phase test documentation planning and test range coordination. Develops DT test cases. Monitoring of SDD contractor system integration build up.											
Government Engineering Support	WR	NAWCAD, Patuxent River				0.357	12/09				
Subtotal Management			0.000	0.000		0.357					
Remarks: Tasking includes execution of SDD contract activities, coordination of Prime Mission Product and support contractor activities, coordination with other USN aircraft program offices, and non-recurring engineering support.											
Total Cost			0.000	0.000		11.000					
Remarks:											

CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0603860N, JPALS	3228 - JPALS INC 1B



R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:

Exhibit R-4a, Schedule Detail							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0603860N, JPALS				PROJECT NUMBER AND NAME 3228 - JPALS INC 1B			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Increment 1B								
Trade Studies F/A-18, F/A-18G	4Q	1Q-4Q	1Q-3Q					
Trade Studies MH-60 R	4Q	1Q-4Q	1Q-4Q					
Milestone B (MS B)								
F/A-18 E/F, EA-18G Design-Build-Test			4Q					

R-1 SHOPPING LIST - Item No. 71

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	45.615	41.568	52.716				
3031 / Single Integrated Air Picture Sys Eng	45.615	41.568	52.716				
9999 / CONGRESSIONAL ADDS	0.000	0.000	0.000				

A. MISSION DESCRIPTION:

At the direction of the Office of the Secretary of Defense and working in conjunction with the SIAP Joint Program Office (JPO), the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 directs the Navy to implement the SIAP program product, Integrated Architecture Behavior Model (IABM), in the following Navy pathfinder programs: Aegis Cruisers and Destroyers, Hawkeye Aircraft (E-2), and Ship Self Defense System (SSDS) platforms. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

The SIAP capability will provide the Navy warfighter with the ability to better understand the joint battlespace and employ weapons to the full extent of their designed capabilities. The SIAP will support the spectrum of offensive and defensive operations by US, allied, and coalition partners in the airspace within a theater of operations (e.g., attack operations, suppression of enemy air defenses, air and missile defense, intelligence preparation of the battlefield). The SIAP is accomplished through a combination of materiel and nonmaterial improvements. This effort through the application of disciplined System Engineering processes, policies, products and services will enable delivery of an integrated, interoperable, reliable, and maintainable Joint SIAP capability in Navy warfare systems/platforms, in the support of Joint and Navy Mission Capabilities.

SIAP capability is being introduced through a series of improvements called Capability Drops, targeted at eliminating specific interoperability issues, providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements, and delivering an executable integrated architecture. The engineering specifications and requirements developed by the engineering efforts will be incorporated into the successive versions of the Joint IABM in a spiral development improvement process. The delivered IABM will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing architecture which will permit the most rapid and least expensive implementation of the IABM and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

Implementation of a platform specific application in the Navy Pathfinder combat systems (E-2, Aegis, and SSDS), will reduce risk of fratricide to US/coalition forces caused by incorrect correlation and ID association and enable warfighters to exploit the full kinematic range of their weapons through better Joint Force integration.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	

This PE provides the resources for the Navy system engineering support to the Joint effort to develop SIAP capability, system engineering support to Navy Pathfinder Programs of Record (E-2, Aegis, SSDS) for integration of the Joint SIAP solution, and funding for the implementation of the IABM into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization program.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	45.456	41.807	42.875
FY10 President's Budget	45.615	41.568	52.716
Total Adjustments	0.159	-0.239	9.841
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.113	0.000
Congressional Adjustments	0.000	0.000	0.000
SBIR/STTR/FTT Assessment	-0.483	0.907	0.000
Program Adjustments	0.642	0.000	10.630
Rate/Misc Adjustments	0.000	-1.259	-0.789
Total	0.159	-0.239	9.841

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010						Total Cost
PE 0603327A Air and Missile Defense Systems Engineering	33.700	54.700	53.100						141.500
PE 0604307N 1447 Surface Combatant Combant System Engineering	149.440	198.909	178.495						526.844

D. ACQUISITION STRATEGY:

The Navy is committed to IABM integration into Navy platforms as model functionality matures and system programmatic considerations (funding and schedules) permit. Individual Pathfinder program IABM implementation will allow identification and resolution of key technical, operational and programmatic issues, and provide lessons learned for future integration into Navy systems which have approved SIAP / IABM requirements. Implementation of IABM in Aegis, E-2, and SSDS platforms will occur per the Office of the Chief of Naval Operations (OPNAV) N8 SIAP Requirements letter and during scheduled software upgrades, to the extent feasible. This implementation of the IABM into Navy platforms will occur upon demonstration of certain critical factors and assumptions. These factors include: "IABM Capability Drop One (CD-1) and CD-1 Follow-On meet Navy Requirements as defined in the OPNAV N8 SIAP Requirements letter and adjudicated System Requirements/Derived System Requirements (SRs/DSRs)" IABM is interoperable / backward compatible with the Cooperative Engagement Capability (CEC) baseline 2.1" IABM capability is equal to or better than existing Pathfinder system capability.

E. MAJOR PERFORMERS:

Naval Surface Warfare Center, Dahlgren VA - Surface Combatant System Engineering and Computer Integration

Naval Air Warfare Center Aircraft Division, Patuxent River MD - Aircraft Platform Integration and System Engineering

Space and Warfare Systems Command, San Diego CA - System Communication

Lockheed Martin Corporation, Moorestown NJ

Raytheon Corporation, St. Petersburg, FL and San Diego, CA

John Hopkins University Applied Physics Laboratory, Laurel MD

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**				PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	45.615	41.568	52.716				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

At the direction of the Office of the Secretary of Defense and working in conjunction with the SIAP Joint Program Office (JPO), the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 directs the Navy to implement the SIAP program product, Integrated Architecture Behavior Model (IABM), in the following Navy pathfinder programs: Aegis Cruisers and Destroyers, Hawkeye Aircraft (E-2), and Ship Self Defense System (SSDS) platforms. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

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SIAP capability is being introduced through a series of improvements called Capability Drops, targeted at eliminating specific interoperability issues, providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements, and delivering an executable integrated architecture. The engineering specifications and requirements developed by the engineering efforts will be incorporated into the successive versions of the Joint IABM in a spiral development improvement process. The delivered IABM will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing architecture which will permit the most rapid and least expensive implementation of the IABM and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

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CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**

This PE provides the resources for the Navy system engineering support to the Joint effort to develop SIAP capability, system engineering support to Navy Pathfinder Programs of Record (E-2, Aegis, SSDS) for integration of the Joint SIAP solution, and funding for the implementation of the IABM into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization program.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
SIAP Engineering Requirements and Architecture Alignment	2.772	1.868	1.700
RDT&E Articles Quantity	0	0	0

FY08: Continued the refinement of the SIAP systems requirements baseline for IABM. Worked to finalize interface specifications in support of adaptation and interface development for the IABM and host systems. Completed support system development and the System Engineering Review Process for IABM CD-1 capabilities. Efforts continued in the interface specifications in support of adaptation and interface development for the IABM and Navy Pathfinder systems. Supported the SIAP IABM Capability Drop 1 (CD-1) System Engineering Design Review Process (Preliminary Design Review) for IABM integration into representative Navy Aegis and E-2 platforms in support of a Joint Combined Hardware-in-the loop Evaluation (JCHE) test event.

FY09: Continue to refine the systems requirements baseline for the additional capabilities in IABM CD-1 Follow-On (FO) for fielding the IABM into the Navy Pathfinder combat systems (Aegis, E-2, and SSDS). Update and finalize CD-1 FO interface specifications in support of adaptation and interface development for the IABM and Navy Pathfinder systems. Support system development and the System Engineering Review Process for additional IABM CD-1 FO capabilities. Develop pathfinder's adaptation layer phasing plans (phasing and mapping of the CD-1 FO Derived System Requirements) and complete associated Host Interface Description Documents. Support interface and architecture specifications in support of the IABM CD-1 FO Design Preliminary Design Review (PDR) and address revised functional alignment of Navy Pathfinder systems.

FY10: Complete Combat Systems Engineering Design Reviews for IABM CD-1 FO integration. Begin to develop requirements and architecture artifacts required to enable post CD-1 FO integration into the Navy Pathfinder systems.

	FY 2008	FY 2009	FY 2010
SIAP System Development	17.710	12.913	9.085
RDT&E Articles Quantity	0	0	0

FY08: Working toward completion of IABM CD-1 domain development in the areas of composite tracking capability and CEC interoperability (CEC Data Manager), combat ID (ASNT/CCID), Tactical Data Link (TDL) management and Peer-to-Peer forwarding (Link Data Dissemination Manager), and Automated Battle Management Aids (Distributed Weapons Coordination (DWC)). Complete development of prototype level interfaces and Adaptation Layers (AL) to accommodate pre-CD-1 (Time Boxes) integration into Aegis and E-2 Hawkeye 2000 test facilities. Complete CD-1 development of prototype Adaptation Layer and interface development including Sensors (SPY OA, UPX 29, SPQ 9B, APS 145, and OL-483/AP), TDLs (JTAL), Sensor Network (Data Distribution System), and Host Command and Control (C2). Convert, adapt, and integrate pre-IABM CD-1 builds into platform specific implementations in Aegis and E-2 Hawkeye 2000 program to enable Navy platform Test and Evaluation (T&E) events (E-2 Integrated Lab Demonstration and Aegis Integration & Test).

FY09: Support IABM CD-1 FO domain development in the areas of composite tracking capability and CEC interoperability (CEC Data Manager) and support the SIAP JPO Rapid Capability Insertion Process (RCIP) in examining Science and Technology (S&T) insertion efforts such as Distributed Multiple-Sensor Integration, Distributed

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**

Multiple-Hypothesis Tracking, Air Tasking Order / Airspace Control Order (ATO/ACO) Associator, and Automated Battle Management Aids (Distributed Weapons Coordination (DWC)). Migrate the developed prototype level interfaces and Adaptation Layers (AL) towards production level in parallel with CD-1 FO development (Time Boxes) to enable integration into Aegis and E-2 Hawkeye 2000 for SIAP Initial Operating Capability (IOC). Continue CD-1 FO prototype Adaptation Layer and interface development for Sensors (SPY OA, UPX 29, SPQ 9B, APS 145, and OL-483/AP) and TDLs (JTAL). Convert, adapt, and integrate IABM CD-1 into platform specific implementations in Aegis and E-2 Hawkeye 2000 programs to enable Navy platform Test and Evaluation (T&E) events (E-2 and Aegis Integration Testing) as well as Joint T&E events (JCHE-5).

FY10: Support IABM CD-1 FO domain development in the areas of composite tracking capability, CEC interoperability (CEC Data Manager), combat ID and selected JPO RCIP initiatives to include, Distributed Multiple-Sensor Integration, Distributed Multiple-Hypothesis Tracking, Air Tasking Order / Airspace Control Order (ATO/ACO) Associator, and Automated Battle Management Aids (Distributed Weapons Coordination (DWC)). Continue to migrate the developed prototype level interfaces and Adaptation Layers (AL) towards production level in parallel with CD-1 FO development (Time Boxes) to enable integration into Aegis, E-2 Hawkeye 2000, and SSDS for Navy SIAP Initial Operating Capability (IOC). Begin SSDS, RSM, and ES protoytype Adaptation Layer and interface development for additional Sensors such as ALQ-217, SLQ 32, Shipboard Advanced Radar Target Identification System (SARTIS), SPS 67, SPS 48E, SPS 49A, and SPS 73. Convert, adapt, and integrate pre-CD-1 FO builds into platform specific implementations in Aegis, E-2 Hawkeye 2000, and SSDS programs to enable Navy platform Test and Evaluation (T&E) events (E-2, Aegis, and SSDS Integration Testing) as well as prepare for Joint T&E events in subsequent years.

	FY 2008	FY 2009	FY 2010
SIAP Test Planning and Execution	6.466	6.229	6.280
RDT&E Articles Quantity	0	0	0

FY08: Perform, element, platform, and System of System level testing to include:
- Update SIAP CD-1 Test and Evaluation (T&E) documentation in support of the SIAP Acquisition Milestones.
- Commence development of T&E Metrics and Data Set
- Conduct T&E planning and execution of E-2 and Aegis Integration of the early IABM Time Boxes to mitigate production implementation risk of IABM.
- Conduct T&E planning of Navy SIAP IV&V and Navy participation in Joint Combined Hardware-in-the-loop Evaluation (JCHE-5) events.

FY09: Perform, element, platform, and System of System level testing to include:
- Update SIAP CD-1 and CD-1 FO Test and Evaluation (T&E) documentation in support of the SIAP Acquisition Milestones.
- Continue development of T&E Metrics and Data Set
- Plan and execute Engineering Assessments of the IABM to support fielding of the IABM CD-1 Follow-On.
- Support CD-1 Operational Assessment
- Assist with JTIC conformance testing
- Develop plan for conducting CEC Backward Compatibility test using near-target AMOD and E-2 hardware configurations
- Complete T&E planning and conduct execution of Navy SIAP IV&V and Navy participation in Joint Combined Hardware-in-the-loop Evaluation (JCHE-5) events.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**

FY10: Perform, element, platform, and System of System level testing to include:
- Update SIAP CD-1 FO Test and Evaluation (T&E) documentation in support of the SIAP Acquisition Milestones.
- Finalize T&E Metrics and Data Set
- Plan and execute Engineering Assessments of the IABM to support fielding of the IABM CD-1 Follow-On.
- Conduct T&E planning and execution of CEC Backward Compatibility test using E-2 and Aegis assets.
- Coordinate and obtain required assets in preparation for formal Navy SIAP Developmental Testing (DT) for CD-1 FO.
- Conduct E-2 flight demonstration
- Continue T&E planning of Navy SIAP IV&V and Navy participation in Joint Combined Hardware-in-the-loop Evaluation (JCHE-6) events.

	FY 2008	FY 2009	FY 2010
SIAP Integration Coordination and Planning	2.379	1.747	1.500
RDT&E Articles Quantity	0	0	0

FY08: For yearly SIAP DAB Milestones, update documentation for Capability Development Document (CDD), Acquisition Program Baseline (APB), Program Protection Plan (PPP), Information Support Plan (ISP), and update Cost Analysis Requirements Document (CARD), Program Life Cycle Cost Estimate (PLCCE), Independent Cost Estimate (ICE), Systems Engineering Plan (SEP), and Acquisition Strategy (AS). Conduct planning for Risk Mitigation and configuration management activities. Monitor and support execution of the Navy SIAP Implementation Plan.

FY09: For yearly SIAP DAB Milestones, update documentation for Capability Development Document (CDD), Acquisition Program Baseline (APB), Program Protection Plan (PPP), Information Support Plan (ISP), and update Cost Analysis Requirements Document (CARD), Program Life Cycle Cost Estimate (PLCCE), Independent Cost Estimate (ICE), Systems Engineering Plan (SEP), and Acquisition Strategy (AS). Conduct planning for Risk Mitigation and configuration management activities. Monitor and support execution of the Navy SIAP Implementation Plan.

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	FY 2008	FY 2009	FY 2010
DDG Mod Platform Specific Model	15.646	19.050	32.140
RDT&E Articles Quantity	0	0	0

FY08: Specific FY08 activity includes:
Aegis SIAP Requirements and Architecture: Perform requirements and gap analysis to support mapping existing Aegis requirements to SIAP IABM System Requirement List (SRLs) /

Derived Requirements List (DSRLs) and Interface Definition Document (IDDs). Account for SIAP requirements in AMOD specifications (from A-Spec through B-5 Spec.). Establish requirements management process to track which requirements are to be implemented in a given AMOD computer program build. Conduct a combined SSR/Delta SDR to review specifications and architecture changes. Establish an allocated Baseline that includes objective architecture alignment by PDR. Assist in development of IABM Interface Design Description (IDD) external and internal interface definitions. Participate in Navy Open Architecture Enterprise Interface Working Groups to define common data model and coordinated interfaces for track management components and any other components that impact IABM CD-1 implementation into Surface Navy Combat Systems. JCHE-5: Support: Develop a prototype SPY adaptation layer to support JCHE-5 that interfaces with the SPY OA Radar control program and the IABM (using the common SAL framework). Deliver associated SPY Sal B-5 level requirements, component interface descriptions (including UML representations), traceability from A-spec to B5 level component specifications. Coordinate with NSWC/DD for upgrades to the ASATS simulation to model the SPY OA radar variant planned for AMOD in preparation for JCHE-5. Begin integration of the SPY, SPQ 9B, and UPX-29 adaptation layers with the IABM in preparation for JCHE-5. Participate in software IPT review of Timebox 43, 44 and 45, as available, and identify design issues that may conflict with open architecture initiatives or adversely impact IABM integration into AMOD. Coordinate through the Navy SIAP IPTs and NTSG to form consensus on Navy feedback to SIAP JPO.

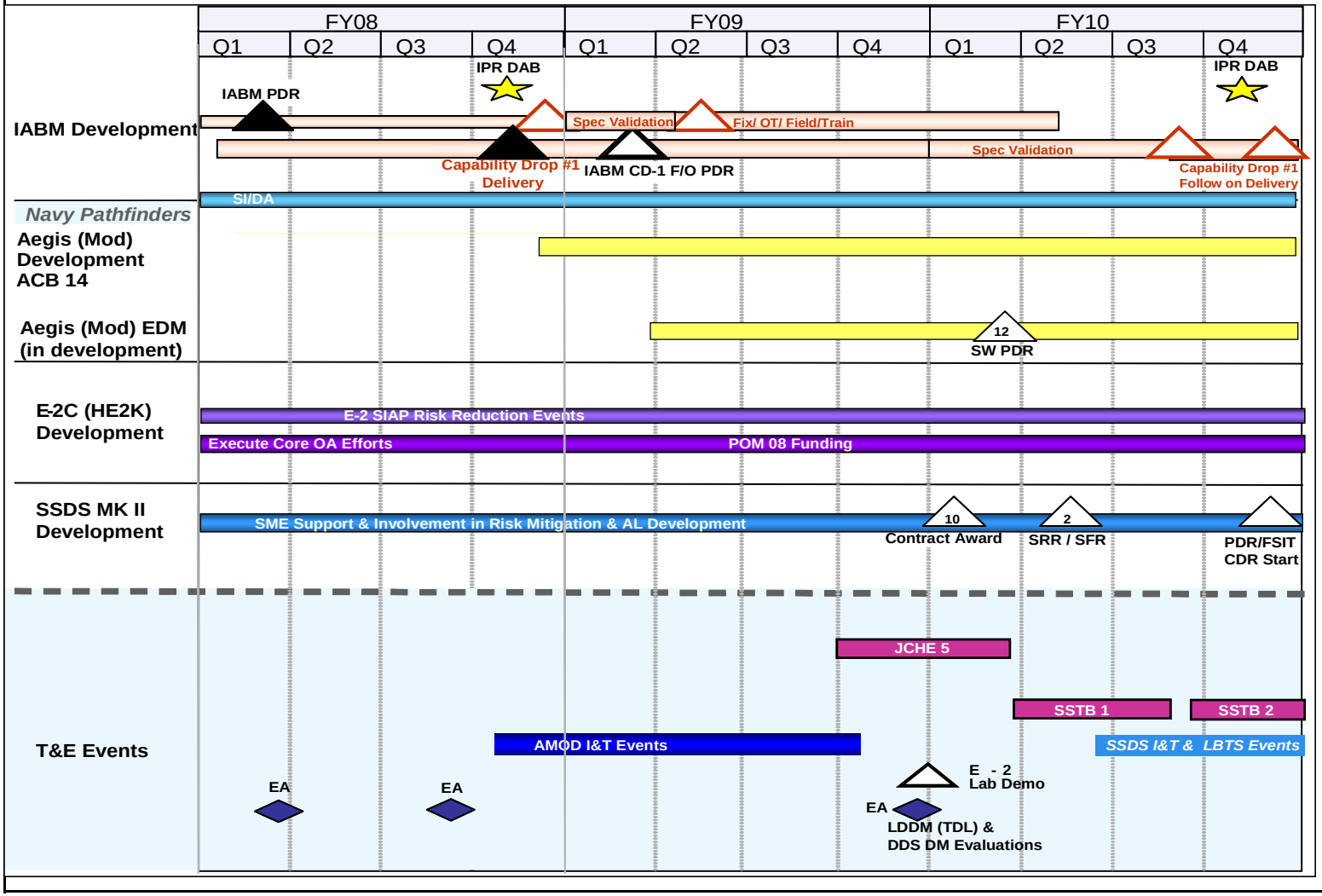
FY09: Specific FY09 activity includes:
Aegis SIAP Requirements and Architecture: Establish an allocated Baseline that includes JTM alignment by PDR. Define common data model and coordinated interfaces for the enterprise track server and the common track manager components for surface Navy combat systems, including component framework Application Programmer Interfaces (APIs), host services APIs, track server APIs from a client perspective, Sensor Adaptation Layer component IDDs, and system track management APIs for the host to use. Develop and/or review requirements and design products and contribute to coordinated Navy comments on SIAP JPO baseline products and other SIAP PDR artifacts, as well as the JAWG JTM SV-4. JCHE-5: Develop a prototype SPY adaptation layer to support JCHE-5 that interfaces with the SPY OA Radar control program and the IABM. Deliver associated SPY SAL B-5 level requirements. Coordinate with NSWC/DD for upgrades to the ASATS simulation to model the SPY OA radar variant planned for AMOD in preparation for JCHE-5. Complete integration of the SPY, SPQ 9B, and UPX-29 adaptation layers with the IABM CD-1 in preparation for JCHE-5.

FY10: Continue translating the IABM Platform Independent Model (PIM) at the component level and develop Platform Specific Model (PSM) and Platform Specific Implementation (PSI) in conjunction with Aegis Modernization (AMOD) Advanced Capability Build 12 development and testing to support fielding. Continue with the required partitioning of the AMOD computer program and application modification for IABM integration. Aegis is required to integrate all of the applicable functionality provided by the IABM CD-1 FO and required partitioning of existing AMOD software and modify existing applications required for successful integration. Prepare for any architecture related changes required to accommodate future IABM spiral improvements.

CLASSIFICATION:		UNCLASSIFIED									
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**				PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**					
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
	VAR	NAVSEA, Washington DC	1.903			0.000		0.000			CONT	0.000
	VAR	PEOIWS, Washington DC	5.517			1.113	NOV-08	1.050	NOV-09		CONT	0.000
	VAR/WR	PEO(T), Pax River, MD	3.174			0.412	NOV-08	0.350	NOV-09		CONT	0.000
	VAR	PEO(C4I), San Diego, CA	2.213			0.343	NOV-08	0.300	NOV-09		CONT	0.000
Subtotal Engineering Requirements			**12.807**			**1.868**		**1.700**			**CONT**	**0.000**
Remarks:												
	VAR	NAVSEA, Washington DC	6.243			0.000		0.000			6.243	0.000
	VAR	PEO IWS	33.690			9.749	NOV-08	8.085	NOV-09		CONT	0.000
	VAR/WR	PEO(T), Pax River, MD	7.208			2.340	NOV-08	2.000	NOV-09		CONT	0.000
	VAR	PEO(C4I), San Diego, CA	2.234			0.585	NOV-08	0.500	NOV-09		CONT	0.000
Subtotal System Development			**49.375**			**12.674**		**10.585**			**CONT**	**0.000**
Remarks:												
	VAR	NAVSEA, Washington DC	2.070			0.000		0.000			2.070	0.000
	VAR	PEO IWS, Washington DC	9.588			3.672	NOV-08	4.491	NOV-09		CONT	0.000
	VAR/WR	PEO(T), Pax River, MD	6.243			1.668	NOV-08	1.500	NOV-09		CONT	0.000
	WR	PEO(C4I), San Diego, CA	2.639			0.889	NOV-08	0.800	NOV-09		CONT	0.000
Subtotal Test & Execution			**20.540**			**6.229**		**6.791**			**CONT**	**0.000**
Remarks:												
	VAR	NAVSEA, Washington, DC	1.095			0.000		0.000			1.095	0.000
	VAR	PEO IWS, Washington, DC	2.148			0.914	NOV-08	0.800	NOV-09		CONT	0.000
	VAR/WR	PEO(T), Pax River, MD	1.627			0.413	NOV-08	0.350	NOV-09		CONT	0.000
	WR	PEO(C4I), San Diego CA	1.448			0.419	NOV-08	0.350	NOV-09		CONT	0.000
Subtotal Integration Planning			**6.418**			**1.746**		**1.500**			**CONT**	**0.000**
Remarks:												
	VAR	Lockheed Martin	29.179			19.051	NOV-08	32.140	NOV-09		CONT	0.000

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**					PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**					
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
Subtotal DDG MOD PSM			**29.179**			**19.051**		**32.140**			**CONT**	**0.000**
Remarks:												
	VAR	Various industry, SBIR Phase III	0.000			0.000	NOV-08	0.000	NOV-09		0.000	0.000
Subtotal Open Architecture Automated Test & Retest			**0.000**			**0.000**		**0.000**			**0.000**	**0.000**
Remarks:												
Total Cost			**118.319**			**41.568**		**52.716**			**CONT**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**	PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603879N/SINGLE INT. AIR PICTURE (SIAP) SYS ENG**			PROJECT NUMBER AND NAME **3031/Single Integrated Air Picture Sys Eng**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
IPR DAB	Q4		Q4				
IABM PDR	Q1						
Capability Drop 1 Delivered	Q4						
Capability Drop 1 Follow-on Delivered			Q4				
AMOD EDM SW PDR			Q1				
SSDS CDR			Q4				
JCHE-5 Test		Q4	Q1				
E-2 Flight Demo			Q1				

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION				DATE May 2009			
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603889N/COUNTERDRUG RDT&E PROJECTS**						
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	65.177	0.000	0.000				
2219 / Counterdrug RDTE Support	57.475	0.000	0.000				
9999 / Congressional Add	7.702	0.000	0.000				

A. MISSION DESCRIPTION:

The Counterdrug RDT&E Projects Program mission is to develop and deploy technology that disrupts, deters, and denies the flow of drugs, people, information, money and weapons related to narcoterrorism.

Project Unit 9999 is comprised of FY08 Congressional Adds for Project Athena and Global Personal Locator Beacon for Counter-Narcoterrorism.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	7.939	0.000	0.000
FY10 President's Budget	65.177	0.000	0.000
Total Adjustments	57.238	0.000	0.000
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	0	0.000	0.000
SBIR/STTR/FTT Assessment	-1.990	0.000	0.000
Program Adjustments	59.228	0.000	0.000
Rate/Misc Adjustments	0.000	0.000	0.000
Total	57.238	0.000	0.000

C. OTHER PROGRAM FUNDING SUMMARY:

D. ACQUISITION STRATEGY:

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603889N/COUNTERDRUG RDT&E PROJECTS**				PROJECT NUMBER AND NAME **2219/Counterdrug RDTE Support**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	57.475	0.000	0.000				
RDT&E Articles Qty	0	0	0				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Counterdrug RDT&E mission is to develop and deploy technology that disrupts, deters, and denies the flow of drugs, people, information, money and weapons related to narcoterrorism.

CLASSIFICATION:	UNCLASSIFIED													
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS													DATE May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603889N/COUNTERDRUG RDT&E PROJECTS**				PROJECT NUMBER AND NAME **2219/Counterdrug RDTE Support**								
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
Developmental Test & Evaluation	MIPR	US ARMY	51.128			0.000		0.000						
Developmental Test & Evaluation	MIPR	US AIR FORCE	16.420			0.000		0.000						
Developmental Test & Evaluation	WR	NRL	2.080			0.000		0.000						
Developmental Test & Evaluation	WR	NPS, MONTEREY	0.246			0.000		0.000						
Developmental Test & Evaluation	MIPR	JTF, FT WASHINGTON	0.012			0.000		0.000						
Developmental Test & Evaluation	WR	NUWC, KEYPORT	2.022			0.000		0.000						
Developmental Test & Evaluation	WR	DOE	0.692			0.000		0.000						
Subtotal Test and Evaluation			**72.600**			**0.000**		**0.000**						
Remarks: Various/VAR - is used for lines with associated funding because multiple activities are being funded for these Cost Categories and there are different award dates for the different activities.														
Program Management Support	WR	NSWC, DAHLGREN	1.400			0.000		0.000						
Subtotal PROGRAM MANAGEMENT SUPPORT			**1.400**			**0.000**		**0.000**						
Total Cost			**74.000**			**0.000**		**0.000**						

CLASSIFICATION:	UNCLASSIFIED							
EXHIBIT R-4a, SCHEDULE DETAIL						DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603889N/COUNTERDRUG RDT&E PROJECTS**				PROJECT NUMBER AND NAME **2219/Counterdrug RDTE Support**			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Development Test & Evaluation	2Q-4Q							

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE August 2008
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603889N/COUNTERDRUG RDT&E PROJECTS**	PROJECT NUMBER AND NAME **9999/Congressional Add**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010	FY 2011
Accomplishments/Effort/Subtotal Cost	1.542	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

9B99A GLOBAL PERSONAL LOCATOR BEACON FOR COUNTER-NARCOTERRORISM

The GPLB (Global Personal Locator Beacon) is a bidirectional search rescue and alerting beacon capable of communicating emergency information to individuals anywhere in the world. The system is intended to help track "at risk" individuals and interact with a wide variety of information sources to help improve response time to emergencies and improve individuals chances of survival. This system can also be integrated into local monitoring systems, sensors and line of sight communications to provide additional monitoring and safety capabilities.

	FY 2008	FY 2009	FY 2010	FY 2011
Accomplishments/Effort/Subtotal Cost	6.160	0.000	0.000	0.000
RDT&E Articles Quantity	0	0	0	0

9830A PROJECT ATHENA

The Athena All-Domain Awareness Fusion Center (ADAFC) test bed provides a system of systems approach for the integration, processing, fusion and situational display of world-wide sensor and data systems information. Athena s open architecture permits the rapid integration of sensors and data, and structured as a Command, Control Intelligence, Surveillance, and Reconnaissance (C2ISR) node, allows it to collect, process, exploit and disseminate information across a wide array of information systems. Athena s spiral development process will continue to enhance its' capabilities and will involve field deployments to refine the system and assess the effectiveness in support of the counter narco-terrorism mission. Lessons learned from these deployments are then used to direct the spiral development process.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**	

COST (In Millions)	FY 2008	FY 2009	FY 2010
Total PE Cost	3.470	4.548	5.003
9823 / Lasers For Navy Applications	0.000	0.000	5.003
9999 / Congressional Add	3.470	4.548	0.000

A. MISSION DESCRIPTION:

In accordance with NAVSEA Notice 5400, Ser 09B/240, Subj: ESTABLISHMENT OF THE NAVY DIRECTED ENERGY WEAPONS PROGRAM OFFICE (PMS 405), dated 4 Jan 02 and NAVSEA Instruction 5400.101, Ser SEA 06/058, Subj: DIRECTED ENERGY AND ELECTRIC WEAPONS PROGRAM OFFICE (PMS 405) CHARTER, dated 21 Jul 04 - COMNAVSEASYSCOM (PMS 405) was assigned as the of Contact for matters related to Directed Energy and Electric Weapon Systems development and acquisition initiation for the Navy and for those matters being coordinated with other Federal agencies and military services. The Naval Directed Energy and Electric Weapon Systems Program Office's (PMS 405) mission is to transition technology from the laboratory to prototype/advanced development/test for operational development and use. This will change the way the Navy fights in the 21st century by providing the war fighter with additional tools to fight today's and tomorrow's wars. This requires the effective management of Technology Development (BA-4) initiatives into System Development and Demonstration. PMS 405 will manage development of Directed Energy and Electric Weapon Systems onboard future naval surface ships that incorporate: Weapons Grade High Energy Lasers, Free Electron Lasers (Megawatt class), Electromagnetic Rail Gun (EMRG) Weapon System, High Power Microwave Weapon/Sensor Systems, and other systems/capabilities.

In FY 09, $1,755K was provided under Project Unit (PU) 9D61A for the Directed Energy Initiative (DEI) to support acceleration of development and testing of the Laser Weapon System (LaWS); $1,596K was provided under PU 9D62A for Guillotine (G) efforts to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions; and $1,197K was provided under PU 9D63A for Multi Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS).

In FY10, funding was provided under Project Unit 9823 to support Pacific Sail Proof of Concept prototype system development and demonstration.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION (CONTINUATION)		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	R-1 ITEM NOMENCLATURE **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	1.987	0.000	0.000
FY10 President's Budget	3.470	4.548	5.003
Total Adjustments	1.483	4.548	5.003
(U) Summary of Adjustments			
Congressional Rescissions	0.000	0.000	0.000
Congressional Adjustments	1.593	4.548	0.000
SBIR/STTR/FTT Assessment	-0.107	0.000	0.000
Program Adjustments	-0.003	0.000	5.003
Rate/Misc Adjustments	0.000	0.000	0.000
Total	1.483	4.548	5.003

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**		PROJECT NUMBER AND NAME **9823/Lasers For Navy Applications**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	0.000	0.000	5.003
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for evaluation in support of tactical ship defense needs.

Funding was established in FY 2010 under this project unit to support laser prototype system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations, short-range ship defense/force protection, long-range tracking and imaging, combat identification, and threat assessment.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**	PROJECT NUMBER AND NAME **9823/Lasers For Navy Applications**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	5.003
RDT&E Articles Quantity	0	0	0

The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for evaluation in support of tactical ship defense needs.

Funding was established in FY 2010 under this project unit to support laser prototype system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations, short-range ship defense/force protection, long-range tracking and imaging, combat identification, and threat assessment.

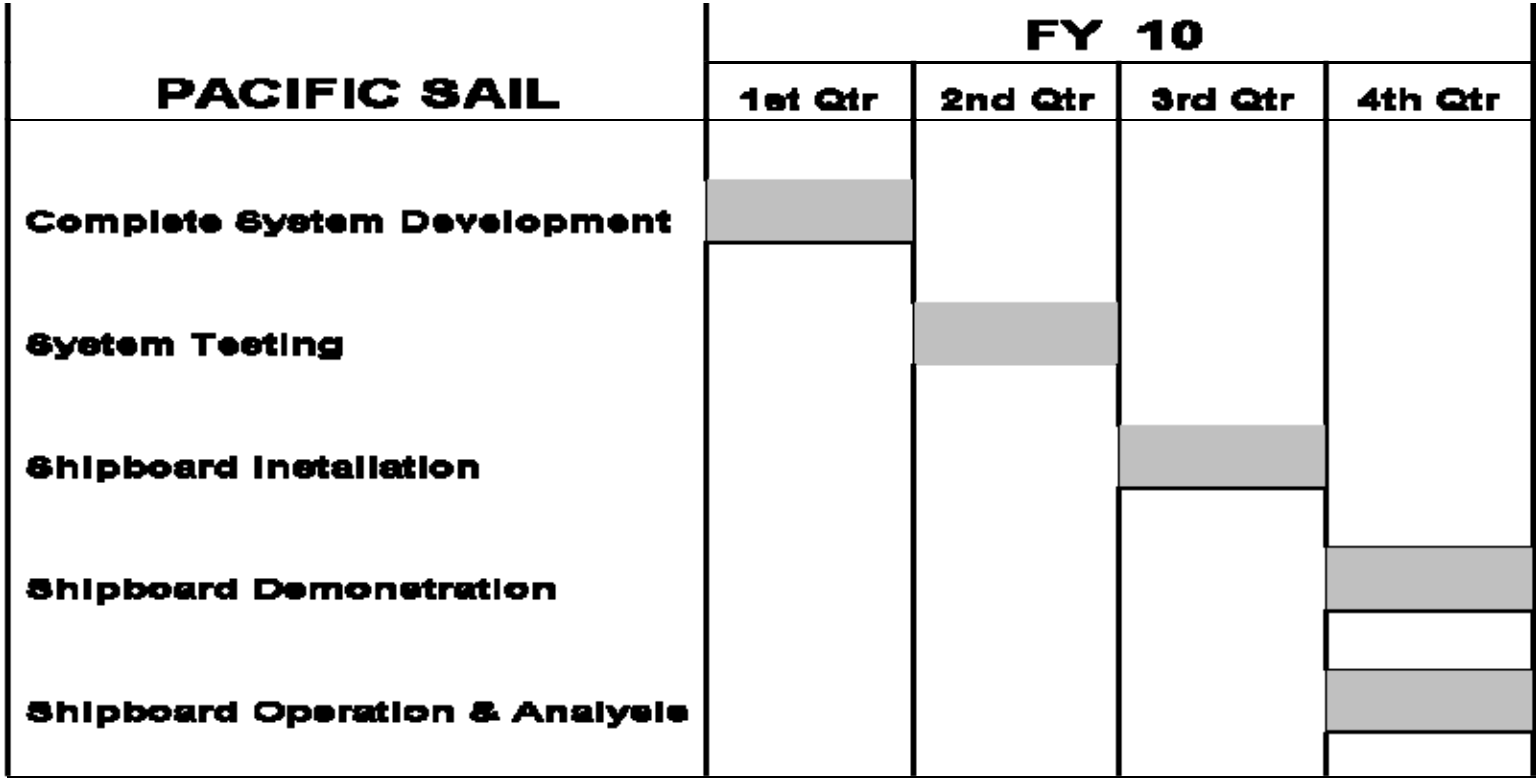
C. OTHER PROGRAM FUNDING SUMMARY:
Not Applicable.

D. ACQUISITION STRATEGY:
Not Applicable.

E. MAJOR PERFORMERS:
Multiple Contractors, Naval Surface Warfare Centers, SPAWAR, AFRL, PMS 405.

CLASSIFICATION:	UNCLASSIFIED								
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS							DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**			PROJECT NUMBER AND NAME **9823/Lasers For Navy Applications**				
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
Lasers for Navy Applications	Various	Various	3.124	0.000		5.003	TBD	8.127	0.000
Subtotal Product Development			**3.124**	**0.000**		**5.003**		**8.127**	**0.000**
Remarks: Multiple funding documents and contract vehicles were utilized to obtain the services of the government field activities, academia, other commands, AFRL, PMS 405 and contractors listed on the R-2a. Costs shown reflect all expenses for the BA-4 R&D (management, engineering,and travel, etc.) affiliated with this Congressional Add.									
Subtotal Support Costs			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**
Remarks:									
Subtotal Test and Evaluation			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**
Remarks:									
Subtotal Management Services			**0.000**	**0.000**		**0.000**		**0.000**	**0.000**
Remarks:									
Total Cost			**3.124**	**0.000**		**5.003**		**8.127**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**	PROJECT NUMBER AND NAME **9823/Lasers For Navy Applications**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**			PROJECT NUMBER AND NAME **9823/Lasers For Navy Applications**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Complete Systems Development			1Qtr				
System Testing			2Qtr				
Shipboard Installation			3Qtr				
Shipboard Demonstration			4Qtr				
Shipboard Operation & Analysis			4Qtr				

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDTEN/BA 4	**0603925N/DIRECTED ENERGY AND ELECTRIC WEAPONS SYSTEMS**	**9999/Congressional Add**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
9D61A/DIRECTED ENERGY INITIATIVE (DEI)	0.000	1.755	0.000
RDT&E Articles Quantity	0	0	0

Funding was provided to support the acceleration of development and testing of the Laser Weapon System (LaWS).

	FY 2008	FY 2009	FY 2010
9D62A/GUILLOTINE (G)	0.000	1.596	0.000
RDT&E Articles Quantity	0	0	0

Funding was provided to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions.

	FY 2008	FY 2009	FY 2010
9D63A/MULTI-FUNCTION LASER SYSTEM (MFLS)	0.000	1.197	0.000
RDT&E Articles Quantity	0	0	0

Funding was provided for Multi-Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS).

	FY 2008	FY 2009	FY 2010
9823A/LASERS FOR NAVY APPLICATION	1.928	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding provided the system engineering and application of laser beam conversion technology, procured and developed with FY 05/06/07 funding, to accomplish beam combining of the two lasers, procured previously, to provide and demonstrate a 30kW laser weapon capability at significantly longer ranges.

	FY 2008	FY 2009	FY 2010
9B98A/SPHERICAL AIRSHIP RESEARCH & DEVELOPMENTAL	1.542	0.000	0.000
RDT&E Articles Quantity	0	0	0

Funding was utilized for the development, construction, and test of the semi spherical aerodynamic shape, propulsion systems, and flight control systems for a mid-altitude (20,000ft) Unmanned Semi Spherical Airship.

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE 0604272N, ANTI-MISSILE TECHNOLOGY (TADIRCM)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	32.364	66.568	63.702					
3040 ANTI-MISSILE TECHNOLOGY (TADIRCM)	26.965	62.978	63.702					
9999 Congressional Add	5.399	3.590						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This element includes development of electronic warfare systems for the United States Navy (USN) and United States Marine Corps (USMC) assault and strike aircraft. This includes the development and testing of advanced Infrared Countermeasures (IRCM) systems for emerging threats and emergency contigencies.

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4	0604272N, ANTI-MISSILE TECHNOLOGY (TADIRCM)

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	32.552	63.244	64.668
Current President's Budget:	32.364	66.568	63.702
Total Adjustments	-0.188	3.324	-0.966
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		3.505	
SBIR/STTR/FTT Assessments	-0.188		
Program Adjustments			-0.962
Rate/Misc Adjustments		-0.181	-0.004
Subtotal	-0.188	3.324	-0.966

Schedule:

The schedule for Tactical Aircraft Infrared Countermeasure (TADIRCM) has changed due to new guidance from OPNAV. An Analysis of Alternatives (AoA) was conducted by N88 to assess the need for an advanced Infrared Countermeasure (IRCM) capability for assault and strike aircraft against surface-to air threats. Conclusions from the AoA determined there was an immediate need for an advanced IRCM capability for assault (rotary wing) aircraft, however, additional analysis was required to evaluate what level of IRCM is required for Strike aircraft. The conclusion of the AoA was that advanced Missile Warning Technology was sufficiently mature to proceed into a System Development and Demonstration (SDD) program, however that Assault Directed Infrared countermeasure (DIRCM) technology for small to medium USN/USMC assault aircraft required the maturity of several technologies prior to being ready for SDD. As a result of the AoA and guidance from OPNAV, PMA-272 was requested to revise the TADIRCM schedule and acquisition strategy to support the fielding of an advanced IRCM capability for USN/USMC Assault aircraft. TADIRCM will now be executed via two separate program increments. The first program will develop, test and field an advanced missile warning capability, designated as the Joint and Allied Threat Awareness System (JATAS). The JATAS contract award is planned for FY2009 and with an Initial Operational Capability (IOC) date of FY2014 planned. The second program will develop, test, and field an Assault DIRCM system with a contract award in FY2012 and IOC 2016.

Technical:

The acquisition strategy has been revised to field an advanced IRCM capability for Assault aircraft. An evolutionary acquisition approach will be implemented in fielding this capability. The capability will be fielded in two increments, with the first increment being an advanced Missile Warning System (MWS) capability. This capability has been designated as JATAS. A JATAS contract award is planned for FY2009 with an IOC planned for FY2014.

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604272N, TADIRCM				PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
3040 ANTI-MISSILE TECHNOLOGY (TADIRCM)	26.965	62.978	63.702					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Tactical Aircraft Direct Infrared Countermeasures (TADIRCM) system provides the war fighter with protection against surface and air-to-air missiles. This project looks at an advanced Infrared Countermesare (IRCM) capability for USN/USMC rotary wing/tilt rotor Assault aircraft against InfraRed (IR) Man Portable Air Defense (MANPAD) and surface-to-air (SAM) threats. This project is divided into two components: 1) An advanced missile warning threat detection capability (Joint and Allied Threat Awareness System) and 2) An advanced IR countermeasure capability (Assault Directed Infrared Countermeasure). JATAS will be the front end of an integrated survivability suite. It will require integration with the APR-39 or follow-on Radar Warning Receiver/EW integration bus, the ALE-47 Countermeasures Dispensing System, and a number of joint and allied platforms. It will also provide advanced capabilities that require extensive testing & evaluation of IRCM techniques.

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0604272N, TADIRCM	3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)	

B. Accomplishments/Planned Program

TADIRCM - JATAS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	22.315	58.978	43.437	
RDT&E Articles Quantity				

Completed a demonstration of the ability of advanced missile warning technology to detect hostile fire threats (i.e. rocket propelled grenade and small arms, etc.). Collected hostile fire data and generated a hostile fire data base that will be used to support the Joint and Allied Threat Awareness System (JATAS) test and evaluation efforts. Plan to fund engineering and program management efforts to support a JATAS contract award in FY2009. Will continue to fund the development of Hostile Fire Indication (HFI) algorithms and demonstrate the maturity of these algorithms in a real time threat environment using modeling and simulation. The Navy decided to increase the TADIRCM funding line to accelerate the fielding of an advanced Infrared Countermeasure (IRCM) capability for rotary wing platforms as a result of the Global War on Terrorism (GWOT).

TADIRCM - Assault	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		2.000	19.265	
RDT&E Articles Quantity				

Plan to fund engineering and program management efforts to support an Assault DIRCM contract award in FY2012. Conduct an early operational assessment flight test demonstration of a light weight DIRCM capability on an Assault aircraft.

JATAS and AssaultDIRCM Pre-MS B, Risk Reduction, SDD Effort	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	4.650	2.000	1.000	
RDT&E Articles Quantity				

Fund efforts to support engineering, program management, and risk reduction efforts for the JATAS and the Assault DIRCM programs. This includes requirement development and contracting efforts for a JATAS and Assault DIRCM contract. Development of applicable modeling and simulation for both programs. Risk reduction efforts in the area of HFI for JATAS and risk reduction/technology development efforts to reduce the size and weight an Assault DIRCM Pointer Tracker System.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0604272N, TADIRCM	3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
P-1 #52, Common ECM, OSIP 005-08	27.904	25.673	2.733

D. ACQUISITION STRATEGY:

OPNAV (N88) completed an Analysis of Alternatives (AoA) in March 2007 to address the need for an Assault Directed InfraRed Countermeasure (DIRCM) capability for assault (rotary wing) platforms Based on the results of the AoA , an evolutionary acquisition strategy will be used to develop an advanced Infrared Countermeasure (IRCM) capability for USN/USMC rotary wing and tilt rotor assault aircraft. This acquisition approach will consist of two program increments 1) the development, test, and fielding of a Missile Warning capability to detect surface-to-air and air-to air InfraRed (IR) threats and 2) an Assault DIRCM system to counter current and future IR threats. The DIRCM sends directed laser energy to the incoming IR threat (once detected by the missile warning system). This approach will accelerate development of the fielding of the missile warning capability while allowing Assault DIRCM technology to mature. Assault DIRCM technology maturation is required to support the size and weight constraints of USN/USMC Assault platforms. The first increment of Assault DIRCM is the missile warning component designated by N88 as the Joint and Allied Threat Awareness System (JATAS). A JATAS contract award is scheduled for FY 2009.

Exhibit R-3 Cost Analysis (page 1)						DATE: May 2009						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0604272N, TADIRCM			PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hdw Development JATAS	C/CPIF	TBD	12.947	36.000	Jun 2009	25.341	May 2010					
Aircraft Integration JATAS	WX	VARIOUS	0.180	4.500	Jun 2009	9.895	May 2010					
Aircraft Integration JATAS	SS/CPIF	DCMA, L M, Owego, NY	2.615									
Aircraft Integration JATAS	C/CPIF	VARIOUS	2.592									
Modeling/Simulation JATAS	WX	VARIOUS	1.940	1.600	Dec 2008	0.400	Dec 2009					
Systems Engineering JATAS	C/CPFF	TEKLA, WOODBRIDGE VA	2.896									
Systems Engineering JATAS	C/CPFF	VARIOUS	.330									
Systems Engineering Gov't JATAS	WX	VARIOUS	2.755	0.625	Nov 2008	1.175	Dec 2009					
Systems Engineering Gov't JATAS	RX	NRL, WASHINGTON DC	1.443	0.400	Nov 2008							
Systems Eng CONG HPFL	WX	NSWC Crane, Indiana	0.288									
Systems Eng CONG Assault	WX	NSWC Crane, Indiana	3.648									
Primary Hdw Development Assault	C/CPIF	TBD		4.000	Mar 2009	8.303	Mar 2010					
Aircraft Integration Assault	TBD	TBD				2.375	Mar 2010					
Modeling/Simulation Assault	WX	VARIOUS				0.300	Dec 2009					
Systems Engineering Gov't Assault	WX	VARIOUS				1.025	Dec 2009					
Subtotal Product Development			31.634	47.125		48.814						

Note:
1. Totals may not add due to rounding.

Exhibit R-3 Cost Analysis (page 2)								DATE: **May 2009**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0604272N, TADIRCM			PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Development Support JATAS	WX	VARIOUS	3.900									
Configuration Management JATAS	WX	VARIOUS		.100	Dec 2008	0.100	Dec 2009					
Integrated Logistics JATAS	WX	VARIOUS	.717	1.525	Dec 2008	1.525	Dec 2009					
Software Development JATAS	WX	NAWCWD POINT MUGU, CA	.475	1.300	Dec 2008	0.400	Dec 2009					
Studies & Analyses Gov't JATAS	WX	VARIOUS	5.960	0.931	Dec 2008							
S & A NonFFRDC JATAS	RX	NRL, WASHINGTON DC	.160									
Technical Data JATAS	WX	NRL, WASHINGTON DC	.250	1.800	Nov 2008							
S & A CONG HPFL GOV	WX	NSWC CRANE, Indiana	0.140									
S&A CONG HPFL	RX	NSWC CRANE, Indiana	1.000									
Software Development Assault	WX	VARIOUS				0.300	Dec 2009					
Integrated Logistics Assault	WX	VARIOUS				1.525	Dec 2009					
Configuration Management Assault	WX	VARIOUS				0.100	Dec 2009					
Subtotal Support			12.602	5.656		3.950						

Exhibit R-3 Cost Analysis (page 3)						DATE: May 2009						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0604272N, TADIRCM			PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY (TADIRCM)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental T & E JATAS	WX	NRL, WASHINGTON DC	1.132	2.000	Dec 2008	0.136	Dec 2009					
Operational T & E JATAS	WX	VARIOUS	.162			0.400	Jan 2010					
ENG & Evaluation JATAS	C/CPFF	TBD	4.892									
ENG & Evaluation Gov't JATAS	WX	VARIOUS	3.257	.500	Nov 2008	0.630	Dec 2009					
Live Fire Support JATAS	WX	VARIOUS				0.200	Feb 2010					
Technical Maturation JATAS	WX	NAWCAD, Pax River MD	2.655									
Technical Maturation JATAS	MP	Fort Belvoir/DTIS	.280									
Developmental T&E MH60S JATAS	WX	NAWCAD, Pax River MD	.236									
Test Assets JATAS	WX	TBD		4.150	Jun 2009	0.820	Jan 2010					
ENG & Evaluation Gov't Assault	WX	VARIOUS				0.202	Dec 2009					
Developmental T&E Assault	WX	NRL, WASHINGTON DC										
Test Assets Assault	WX	TBD		0.200	Jun 2009	3.600	Jan 2010					
Live Fire Support Assault	WX	VARIOUS										
Subtotal T&E			12.614	6.850		5.988						
Remarks:												
Contractor Engineering Supt JATAS	C/CPFF	VARIOUS	2.675	1.000	Nov 2008	0.600	Dec 2009					
Gov't Engineering Supt JATAS	WX	VARIOUS	1.942	1.350	Nov 2008	0.430	Dec 2009					
Program Management Supt JATAS	C/CPFF	VARIOUS	1.539	.750	Nov 2008	0.750	Dec 2009					
Travel JATAS	WX	NAVAIR	.534	.195	Oct 2008							
Transportation JATAS	MP	DIA, Redstone, AL	.015									
Direct Support Costs JATAS	WX	VARIOUS	.365	.052	VARIOUS							
Cost Analysis Support JATAS	WX	NAWCAD, Pax River MD	.200			0.300	Dec 2009					
Contracting Procure Fee JATAS	WX	NAWCAD, Pax River MD	.048									
Acquisition Program Office JATAS	WX	NAWCAD, Pax River MD	.185									
Eng & Eval CONG HPFL Gov	WX	NSWC CRANE, INDIANA	.095									
En & Ev CONG ASSAULT	MP	FT. MONMOUTH, NJ	.326									
Travel CONG HPFL	WX	CRANE	.020									
NAWCAD Pax Support JATAS	WX	NAWCAD, Pax River MD	1.006			0.620	Dec 2009					
Contractor Engineering Supt Assault	C/CPFF	VARIOUS				0.600	Dec 2009					
Gov't Engineering Supt Assault	WX	VARIOUS				0.430	Dec 2009					
Cost Analysis Support Assault	WX	NAWCAD, Pax River MD				0.300	Dec 2009					
NAWCAD Pax Support Assault	WX	NAWCAD, Pax River MD				0.620	Dec 2009					
Program Management Supt Assult	C/CPFF	VARIOUS				0.300	Dec 2009					
Subtotal Management			8.950	3.347		4.950						
Remarks:												
Total Cost			65.800	62.978		63.702						
Remarks:												

Note:

1. Totals may not add due to rounding.

EXHIBIT R4, Schedule Profile		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604272N, TADIRCM	PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY

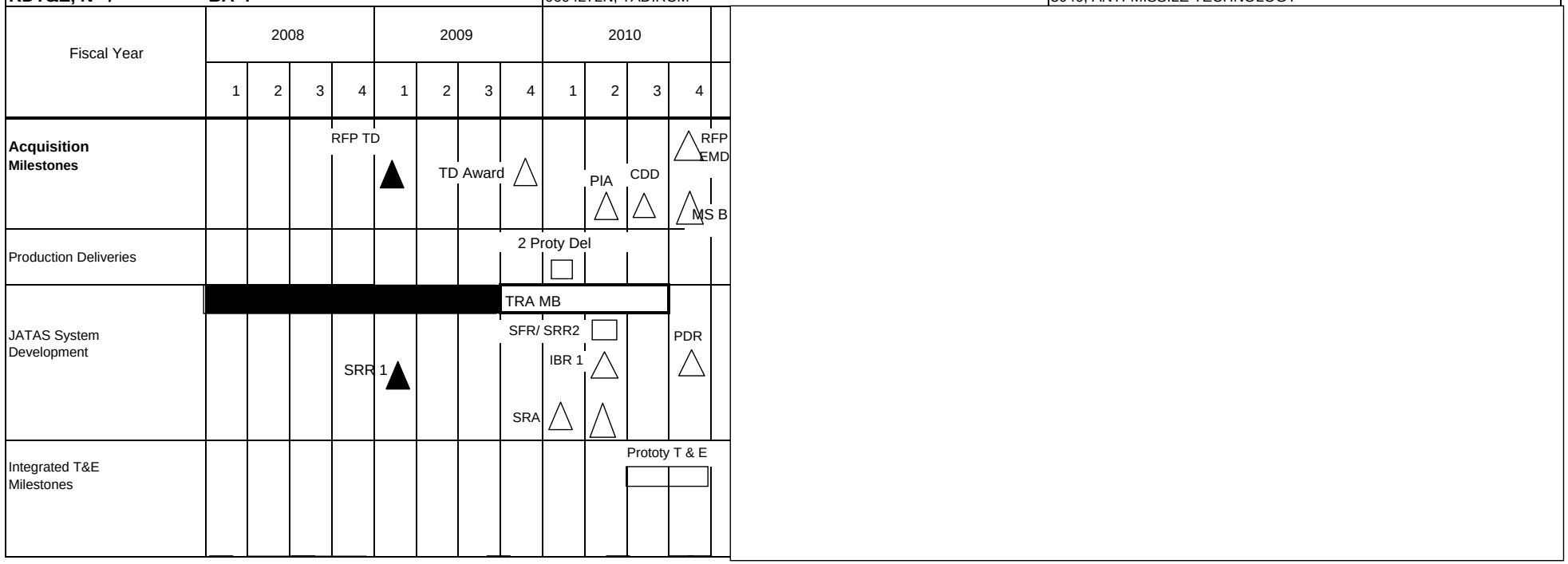


Exhibit R-4a, Schedule Detail							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0604272N, TADIRCM				PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY			
Schedule Profile (JATAS)	FY 2008	FY 2009	FY 2010					
Technology Readiness Assessment for Milestone B (TRA MB)	1Q-4Q	1Q-4Q	1Q-3Q					
Request for Proposal for Technology Demo (RFP for TD)		1Q						
System Requirements Review 1 (SRR)		1Q						
Technology Demonstration Award		4Q						
Prototype Delivery (2)			1Q					
Schedule Risk Assessment (SRA)			1Q					
System Functional Review/System Requirements Review 2 (SFR/SRR)			2Q					
Platform Integration Award			2Q					
Integrated Baseline Review 1 (IBR)			2Q					
Prototyping Test and Evaluation (T+E)			3Q-4Q					
Capabilities Development Document (CDD)			3Q					
Preliminary Design Review (PDR)			4Q					
Milestone B			4Q					
Request for Proposal for EM Development and Demonstration (RFP for EMDD)			4Q					

EXHIBIT R4, Schedule Profile			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604272N, TADIRCM	PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY (Assault DIRCM)	

Fiscal Year	2008				2009				2010						
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Acquisition Milestones															
Production Deliveries															
Assault	RR-F1							RR: F I							
DIRCM	RR: P I								RR: P I						
Integrated T&E Milestones															

Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT 0604272N, TADIRCM				PROJECT NUMBER AND NAME 3040, ANTI-MISSILE TECHNOLOGY			
Schedule Profile (JATAS)	FY 2008	FY 2009	FY 2010					
Risk Reduction FI	1Q-4Q	1Q-4Q	1Q-4Q					
Risk Reduction PI	1Q-4Q	1Q-4Q	1Q-4Q					
System Requirements Review 1 (SRR)								
Request for Proposal for Technology Demo (RFP for TD)								
Technology Readiness Assessment for Milestone B (TRA)								
Technology Demonstration Award								
Schedule Risk Assessment (SRA)								
System Functional Review/System Requirements Review 2 (SFR/SRR)								
Platform Integration Award								
Integrated Baseline Review 1 (IBR)								
Capabilities Development Document (CDD)								
Preliminary Design Review (PDR)								
Prototype Delivery (2)								
Milestone B								
Request for Proposal for EM Development and Demonstration (RFP for EMDD)								

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604272N, TADIRCM				PROJECT NUMBER AND NAME 9999, Congressional Adds			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
9999 Congressional Add	5.399	3.590						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Congressional Adds. FY08 High Power Fiber Laser funding was authorized for the Advanced IRCM (InfraRed Countermeasure) Demonstrator project. The purpose is to rapidly develop a protype to prove that insertion of new laser technology can yield a more robust solution to the Infrared (IR) missile threat at lower cost and with less risk while still advancing the date for Initial Operational Capability (IOC).

FY08 and FY09 Assault DIRCM Congressional Add funding is/was authorized for risk reduction efforts to include the incorporation of laser warning and advanced infrared missle warning in a form facrot consistent with current aircraft installation hardware and to deomonstrate a less cost IRCM solution that addresses not only surface to air and air to air missile threats but also enhanced collision avoidance and protection against the downing of aircraft by small arms and rocket propelled grenade assaults.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0604272N, TADIRCM	9999, Congressional Adds

B. Accomplishments/Planned Program

9C01A-High Power Fiber Laser	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.543			
RDT&E Articles Quantity				

Funding is authorized for the Advanced IRCM (InfraRed Countermeasure) Demonstrator project. The purpose is to rapidly develop a protype to prove that insertion of new laser technology can yield a more robust solution to the Infrared (IR) missile threat at lower cost and with less risk while still advancing the date for Initial Operational Capability (IOC).

9C00A-Assault DIRCM Congressional Add	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.856	1.994		
RDT&E Articles Quantity				

Funding is authorized for risk reduction efforts to include the incorporation of laser warning and advanced infrared missle warning in a form consistent with current aircraft installation hardware and to deomonstrate a less cost IRCM solution that addresses not only surface to air and air to air missile threats but also enhanced collision avoidance and protection against the downing of aircraft by small arms and rocket propelled grenade assaults.

9D64A Compact ultra-Fast Laser System	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		1.596		
RDT&E Articles Quantity				

Funding is authorized for risk reduction efforts to include development and testing of High Power Fiber Laser (HPFL) and Ultra-Short Pulse Lasers (USPL) for application to airborne self-protection for application to airborne self-protection against surface-to-air and air-to-air missile threats consistent with current aircraft installation and hardware.

R-1 SHOPPING LIST - Item No. 75

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE 0604450N JOINT AIR-TO-GROUND MISSILE (JAGM)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**11.626**							
2211 JOINT AIR-TO-GROUND MISSILE	**11.626**							

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) JOINT AIR TO GROUND MISSILE (JAGM): JAGM is an Army-led close-air-support missile program that will utilize tri-mode seeker technology and be employed against land and maritime stationary and moving targets. JAGM will provide a fixed wing, rotary wing, and unmanned aircraft system launched missile system that provides advanced Line-of-sight and Beyond-line-of-sight capabilities, including precision point targeting and fire and forget seeker technologies; increased range; and increased lethality against soft and hardened moving and stationary targets. Its multi-mode seeker will provide robust capability in adverse weather, day or night, and in an obscured/countermeasure environment, against both stationary and moving targets. Initial Navy platform integration efforts include the F/A-18E/F, AH-1Z and MH-60R platforms. The JAGM system includes the missiles, trainers, containers, support equipment, and launcher modifications.

FY 2009 and FY 2010 funds are budgeted under R-1 # 132, Program Element 0605450N, Project Unit 2211.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**	R-1 ITEM NOMENCLATURE 0604450N JOINT AIR-TO-GROUND MISSILE (JAGM)

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	14.680		
Current BES	11.626		
Total Adjustments	-3.054		
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments			
SBIR/STTR/FTT Assessments	-0.118		
Program Adjustments	-2.936		
Rate/Misc Adjustments			
Subtotal	-3.054		

Schedule:

FY 2009 and FY 2010 funds are budgeted under R-1 # 132, Program Element 0605450N, Project Unit 2211.

Technical:

Not Applicable

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		R-1 ITEM NOMENCLATURE **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR (JCREW)**					
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	0.000	0.000	67.843				
3177 / Joint Counter Radio-Controlled IED Elec Warfare	0.000	0.000	67.843				

A. MISSION DESCRIPTION:

Provides for the research and development of Electronic Warfare (EW) systems, equipment, procedures, and tactical aids for all military services against the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet global joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide Joint CREW development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with a migrating global threat. This program also includes development of Electromagnetic Environment (EME) data collection and analysis equipment that provides for the research, development and integration of realistic electromagnetic environments for primary use in the development, assessment, modeling, simulation, test and evaluation of CREW systems. Funding for this effort is required for Counter-IED initiatives being transferred from the Joint IED Defeat Organization (JIEDD0) in accordance with DEPSECDEF memo of 14 August 2007 and in accordance with DOD Directive 2000.19E.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2008	FY 2009	FY 2010
FY09 President's Budget	0.000	0.000	*69.370
FY10 President's Budget	0.000	0.000	67.843
Total Adjustments	0.000	0.000	-1.527
(U) Summary of Adjustments			
Program Adjustments			-0.600
Rate/Misc Adjustments			-0.927
Total	0.000	0.000	-1.527

*Prior to FY10, the Joint Counter Radio Controlled IED Electronic Warfare program was part of PE 0603654N.

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. and Name	FY 2008	FY 2009	FY 2010					To Complete	Total Cost

D. ACQUISITION STRATEGY:

Analysis of Alternatives (AOA) studies are always conducted prior to the initiation of new subprojects. The AOA addresses and emphasizes acquisition strategies of the most cost effective solution over subprojects' life-cycle. At significant decision points, the AoA will be re-validated or updated to reflect changes in technology and threat. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Procurements across the services may be combined to gain quantity discounts.

E. MAJOR PERFORMERS:

TBD - Performers will be selected based upon a competitive process.

CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR (JCREW)**				PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**		
COST (In Millions)	FY 2008	FY 2009	FY 2010				
Project Cost	0.000	0.000	67.843				
RDT&E Articles Qty	0	0	0	0	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Provides for the research and development of EW systems, equipment, procedures, and tactical aids for all military services against the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. The Navy has been designated as DOD Executive Agent and Single Manager for Military Ground-Based Counter Radio-Controlled Improvised Explosive Warfare (CREW) Technology by DOD Directive 5101.14 of 11 June 2007, requiring RDT&E to develop capabilities that meet global joint requirements. Utilize Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provide Joint CREW development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with a migrating global threat. This program also includes development of Electromagnetic Environment (EME) data collection and analysis equipment that provides for the research, development and integration of realistic electromagnetic environments for primary use in the development, assessment, modeling, simulation, test and evaluation of CREW systems. Funding for this effort is required for Counter-IED initiatives being transferred from the Joint IED Defeat Organization (JIEDD0) in accordance with DEPSECDEF memo of 14 August 2007 and in accordance with DOD Directive 2000.19E.

*Prior to FY10, the Joint Counter Radio Controlled IED Electronic Warfare program was part of PE 0603654N.

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR (JC**	PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

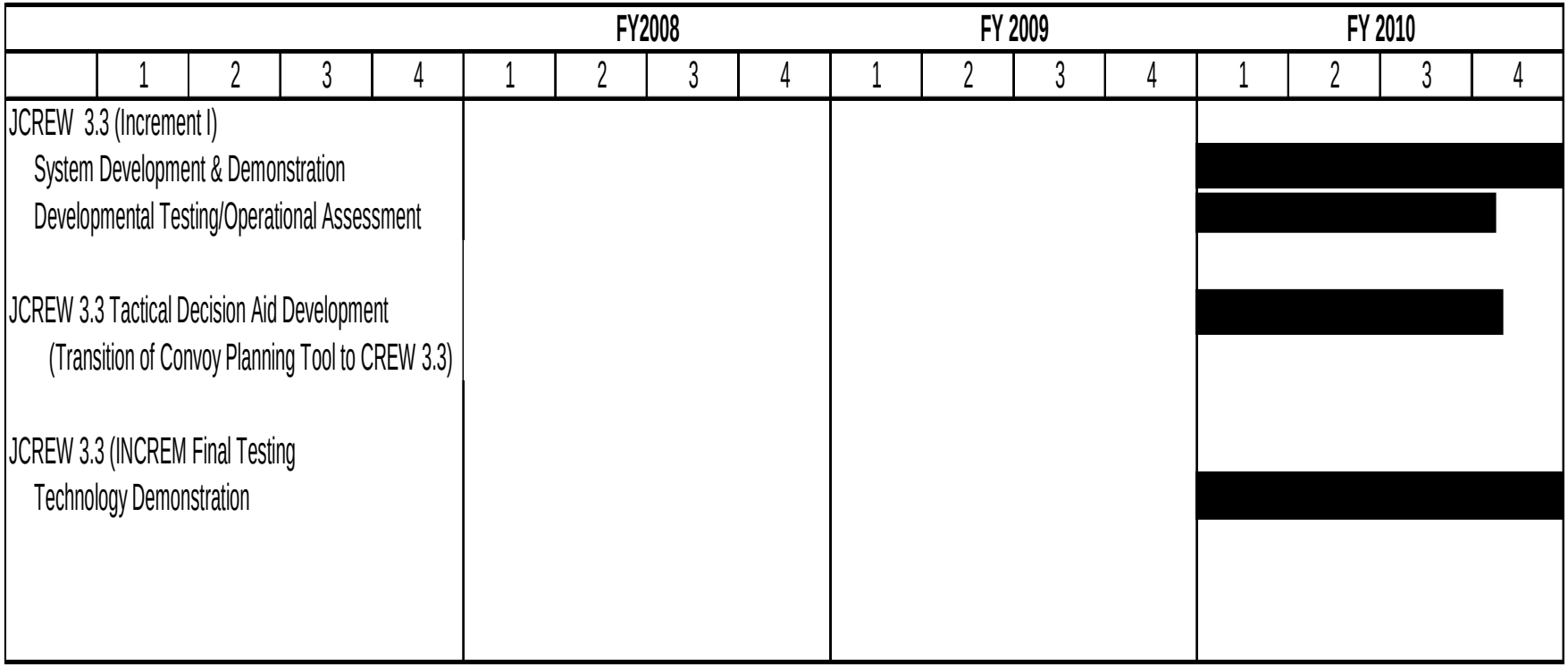
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.000	0.000	67.843
RDT&E Articles Quantity	0	0	0

Defines the effort required for the design, engineering, development, fabrication and test of contractor's development models for in-house verification and validation for governmental developmental testing for JCREW System of Systems (SoS) to include the System Development and Demonstration (SD&D) Phase. The JCREW SoS approach includes three distinct capabilities that shall be developed and will utilize common component, software, and hardware solutions for an open, flexible, and compatible system design approach that is modular. These capabilities are: mobile dismounted operations, mobile ground, and waterborne transport and combat systems (mounted) and semi-permanent geographical area (fixed) systems. All capabilities will have coalition sharing capabilities. Multiple awards will be made for all capabilities.

Provides for development, testing, and evaluation of Joint CREW modeling and simulation efforts, including the transition of Convoy Planning Tool upgrades to Joint CREW tactical decision aids.

CLASSIFICATION:	UNCLASSIFIED											
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**		PROGRAM ELEMENT NUMBER AND NAME **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR (JCREW)**					PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**					
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
Primary Hardware Development		TBD	0.000			0.000		7.540	MAY-10		7.540	0.000
Software Development		TBD	0.000			0.000		12.560	JAN-10		12.560	0.000
Systems Engineering		Various	0.000			0.000		6.890	OCT-09		6.890	0.000
ILS		Various	0.000			0.000		1.960	OCT-09		1.960	0.000
System Integration		Various	0.000			0.000		2.700	OCT-09		2.700	0.000
Loadset Development		Various	0.000			0.000		3.630	OCT-09		3.630	0.000
Subtotal Product Development			**0.000**			**0.000**		**35.280**			**35.280**	**0.000**
Remarks:												
Program Management Support		Various	0.000			0.000		5.620	OCT-09		5.620	0.000
Software Support		Various	0.000			0.000		0.000			0.000	0.000
Training Development		Various	0.000			0.000		0.880	OCT-09		0.880	0.000
Integrated Logistics Support		Various	0.000			0.000		0.500	OCT-09		0.500	0.000
Configuration Management		Various	0.000			0.000		0.980	OCT-09		0.980	0.000
Technical Data		Various	0.000			0.000		0.000			0.000	0.000
Subtotal Support Costs			**0.000**			**0.000**		**7.980**			**7.980**	**0.000**
Remarks:												
Development Test & Evaluation		Various	0.000			0.000		9.230	OCT-09		9.230	0.000
Operational Test & Evaluation		Various	0.000			0.000		1.890	OCT-09		1.890	0.000
Subtotal Test and Evaluation			**0.000**			**0.000**		**11.120**			**11.120**	**0.000**
Remarks:												
Program Management Support			0.000			0.000		4.830	OCT-09		4.830	0.000
Miscellaneous			0.000			0.000		8.633	OCT-09		9.588	0.000
Subtotal Management Services			**0.000**			**0.000**		**13.463**			**13.463**	**0.000**
Remarks:												
Total Cost			**0.000**			**0.000**		**67.843**			**67.843**	**0.000**

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR**	PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**



CLASSIFICATION:	UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL					DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 4**	PROGRAM ELEMENT NUMBER AND NAME **0604653N/JT CNTR RADIO CONTROLLED IED ELEC WAR (JCREV**			PROJECT NUMBER AND NAME **3177/Joint Counter Radio-Controlled IED Elec Warfare**			
Schedule Profile	FY 2008	FY 2009	FY 2010				
JCREW 3.3 (Increment I)							
System Development & Demonstration			1Q-4Q				
Developmental Testing/Operational Assessment			1Q-4Q				
Developmental Testing/Operational Testing							
Milestone C							
LRIP							
Full Rate Production Decision							
Production							
JCREW 3.3 Tactical Decision Aid Development (Transition of Convoy Planning Tool t			1Q-4Q				
JCREW 3.3 System Demonstration, Test and Eval of TDA and EME							
JCREW 3.3 Electromagnetic Environment (EME) Data Collection and Analysis							
JCREW 3.3 (Increment II)							
Technology Demonstration			1Q-4Q				
System Development & Demonstration (Contract Award)							
System Development & Demonstration							
Milestone C							
LRIP							
Full Rate Production Decision							
Production							

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**					R-1 ITEM NOMENCLATURE 0604659N, Precision Strike Weapons Development Program			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**0.000**	**0.000**	**40.926**					
3214 Fuze Development Program	**0.000**	**0.000**	**28.510**					
3215 Strike Weapons Technology Demonstrations	**0.000**	**0.000**	**12.416**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Precision Strike Weapons Development program provides for initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for the horizontal integration among current and future weapon system capabilities. This program will also provide the Navy with the opportunity to improve upon the accuracy, lethality, inoperability, and overall effectiveness of current and future precision strike weapons. This program element was established in FY2010 and includes the new start project units FMU-164 Fuze and Hard Target Void Sensing Fuze (HTVSF) (PU: 3214) and Strike Weapons Technology Demonstration (SWTD) (PU: 3215).

Project 3214 - The current funding profile provides funding for the FMU-164/Bomb Fuze and the Hard Target Void Sensing Fuze (HTVSF) . The system design and development of the FMU-164/B Bomb Fuze is intended to upgrade and expand the capabilities of the Navy's bomb fuze inventory. The FMU-164/B Bomb Fuze provides the Warfighter with next-generation bomb fuze capability including a Serial Data Interface (SDI), which provides additional in-flight cockpit selectable fuze arm/functional delay times and provides increased reliability. The FMU-164/B is used to initiate General Purpose (GP), penetrator, Joint Direct Attack Munition (JDAM), and Laser Guided Bomb (LGB) weapons . The FMU-164/B will reduce the Navy fuze footprint by combining capabilities of the existing FMU-139C/B an FMU-143 fuse. The HTVSF meets a capability gap requirement for harder, deeper and more complex targets. The HTVSF will provide in-flight cockpit reprogramming with fuze time delay options providing aircrew the ability to detonate penetrating bombs at various levels within multi-story complex target facilities.

Project 3215 - The overall intent of the Strike Weapons Technology Demonstration (SWTD) is to demonstrate, operationally assess, rapidly deploy, and transition capability solutions and innovative concepts to address the joint, coalition and interagency operational gaps and shortfalls. The Combatant Commands drive SWTDs through their stated operational priorities and needs, which are applied to an agile acquisition process that yields results years ahead of traditional material development cycles.

The SWTD will demonstrate robust, end-to-end kill chains of enemy surface combatants. Intelligence Surveillance and Reconnaissance (ISR) platforms will include the USAF E-8 Joint Surveillance Targeting Attack Radar System (JSTARS) and the USN P-3 Littoral Surveillance Radar System (LSRS). The launch platform will be the FA-18 Hornet. Weapons will include the AGM-154C Joint Stand-off Weapon (JSOW-C-1), AGM-84M Harpoon Block III, and the AGM-84K Stand-off Land Attack Missile-Expanded Response (SLAM-ER). In the case of the SLAM-ER, the FA-18 will translate ISR Link-16 targeting information and transmit that information to the SLAM-ER with J3.3/J3.5 messages via the AWW-13 pod. By implication, USN Harpoon-equipped surface combatants will be capable of employing their surface-launched Harpoons in a similar fashion. The focus will be on in-flight targeting messages going directly from the ISR platforms to the weapons themselves.

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4**	R-1 ITEM NOMENCLATURE 0604659N, Precision Strike Weapons Development Program

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	0.000	0.000	0.000
Current BES	0.000	0.000	40.926
Total Adjustments	0.000	0.000	40.926
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments			
SBIR/STTR/FTT Assessments			
Program Adjustments			40.928
Rate/Misc Adjustments			-0.002
Subtotal	0.000	0.000	40.926

Schedule: Not Applicable

Technical: Not Applicable

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604659N, Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3214, Fuze Development Program			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**0.000**	**0.000**	**28.510**					
RDT&E Articles Qty (Note 1)			**289**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Precision Strike Weapons Development program provides for initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for the horizontal integration among current and future weapon system capabilities. This program will also provide the Navy with the opportunity to improve upon the accuracy, lethality, inoperability, and overall effectiveness of current and future precision strike weapons.

The current funding profile provides funding for the FMU-164/Bomb Fuze and the Hard Target Void Sensing Fuze (HTVSF) . The system design and development of the FMU-164/B Bomb Fuze is intended to upgrade and expand the capabilities of the Navy's bomb fuze inventory. The FMU-164/B Bomb Fuze provides the Warfighter with next-generation bomb fuze capability including a Serial Data Interface (SDI), which provides additional in-flight cockpit selectable fuze arm/functional delay times and provides increased reliability. The FMU-164/B is used to initiate General Purpose (GP), penetrator, Joint Direct Attack Munition (JDAM), and Laser Guided Bomb (LGB) weapons . The FMU-164/B will reduce the Navy fuze footprint by combining capabilities of the existing FMU-139C/B an FMU-143 fuse. The HTVSF meets a capability gap requirement for harder, deeper and more complex targets. The HTVSF will provide in-flight cockpit reprogramming with fuze time delay options providing aircrew the ability to detonate penetrating bombs at various levels within multi-story complex target facilities.

Note: First article quantity includes FMU-164/B (FY10-Quantity 284) and Hard Target Void Sensing Fuze (FY10-Quantity 5).

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0604659N, Precision Strike Weapons Development Program	3214, Fuze Development Program	

B. Accomplishments/Planned Program

FMU-164/B PRIMARY HARDWARE DEVELOPMENT	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	23.696	
RDT&E Articles Quantity			284	

Funding is for FMU-164/B prototype development, fabrication and confidence testing of the prototypes. This phase of testing includes Explosive Train Qualifications tests and Target Penetration (sled) tests. These tests will be conducted to gather design information. RDT&E test units are consumed during testing by the contractor.

FMU-164/B DESIGN QUALIFICATION	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	1.314	
RDT&E Articles Quantity				

Funding is for FMU-164/B fabrication and testing of design qualification fuzes. Testing includes: Insensitive Munition, Hazard Classification, Electro-Magnetic Environment, Product Oriented Packaging and Target Penetration (sled) tests.

HARD TARGET VOID SENSING HARDWARE DEVELOPMENT	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	3.500	
RDT&E Articles Quantity			5	

Funding is for Hard Target Void Sensing Hardware development, prototyping and confidence testing. This phase includes explosive train qualification test and target penetration tests.

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0604659N, Precision Strike Weapons Development Program	3214, Fuze Development Program

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

The FMU-164/B will provide a capability upgrade to the existing FMU-139 and FMU-143 Bomb Fuzes. The capability upgrades include in-flight cockpit selectability via a Serial Data Interface and increased reliability. The FMU-164/B will also be Insensitive Munition compliant. Program plan consists of System Design and Demonstration in FY10 followed by Low Rate Initial Production in FY13 and Full Rate Production in FY14. The Hard Target Void Sensing Fuze Joint Capabilities Technology Demonstration (JCTD) is considered a risk reduction effort. The JCTD supports 2 competitively selected sources for development and testing of initial prototyping. Following the JCTD, a down select to a single source will occur and enter into a 33 month SDD effort followed by LRI and FRP.

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)							DATE: **May 2009**					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0604659N, Precision Strike Weapons Development Program			PROJECT NUMBER AND NAME 3214, Fuze Development Program						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
PRODUCT DEVELOPMENT												
Primary Hardware Development	C/CPIF	TBD				24.366	12/09					
Ancillary Hardware Development	WX	NAWC WD China Lake, CA				1.314	12/09					
Subtotal Product Development			0.000	0.000		25.680						
SUPPORT												
Subtotal Support			0.000	0.000		0.000						

Remarks:

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**			PROGRAM ELEMENT 0604659N, Precision Strike Weapons Development Program			PROJECT NUMBER AND NAME 3214, Fuze Development Program						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
TEST & EVALUATION												
Subtotal T&E			0.000	0.000		0.000						
Remarks:												
MANAGEMENT												
Contractor Engineering Support	C/CPFF	TBD				0.303	12/09					
Government Engineering Support	WX	Various				2.262	12/09					
Program Management Support	C/CPIF	TBD				0.200	12/09					
Travel	TO	NAVAIR, Patuxent River				0.065	10/09					
Subtotal Management			0.000	0.000		2.830						
Remarks:												
Total Cost			0.000	0.000		28.510						
Remarks:												

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R4, Schedule Profile													DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N** **BA-4**									PROGRAM ELEMENT NUMBER AND NAME 0604659N, Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3214, Fuze Development Program
Fiscal Year	FY 2008				FY 2009				FY 2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
FMU-164/Bomb Fuze **Acquisition** **Milestones**									☆ MS B				
Development Phase										Development Phase			
Development Critical Events													
Test Unit Deliveries													
Test & Evaluation **Milestones** Developmental Test Integrated Operational T & E													
Production Milestones Low Rate Initial Production Full Rate Production Deliveries													

CLASSIFICATION:

Exhibit R-4a, Schedule Detail			DATE: **May 2009**					
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-4	PROGRAM ELEMENT 0604659N Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3214, Fuze Development Program			
Schedule Profile-FMU-164/Bomb Fuze	FY 2008	FY 2009	FY 2010					
Milestone B			1Q					
Development Phase			1Q-4Q					

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R4, Schedule Profile

DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N **BA-4**	0604659N, Precision Strike Weapons Development Program	3214, Fuze Development Program

Fiscal Year	FY 2008				FY 2009				FY 2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Hard Target Void Sensing Fuze (HTVSF)												
Acquisition Milestones												△ MS B
Development Phase					JCTD						EMD	
Development Critical Events										△ CDR		
Test Unit Deliveries												
Test & Evaluation Milestones												
Developmental Test												
Integrated Operational T & E												
Production Milestones												
Low Rate Initial Production												
Full Rate Production												
Deliveries												

Note: Program funded in Small Diameter Bomb PE 0604329N in FY09

R-1 SHOPPING LIST - Item No. 78

Exhibit R-4a, Schedule Detail						DATE: **May 2009**		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E,N / BA-4	0604659N Precision Strike Weapons Development Program				3214, Fuze Development Program			
Schedule Profile- Hard Target Void Sensing Fuze (HTVSF)	FY 2008	FY 2009	FY 2010					
Milestone B			4Q					
Joint Capability Technology Demonstration		1Q-4Q	1Q-2Q					
Development Phase			1Q-4Q					
Critical Design Review (CDR)			3Q					

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0604659N, Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3215, Strike Weapons Technology Demonstrations			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**0.000**	**0.000**	**12.416**					
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The overall intent of the Strike Weapons Technology Demonstrations (SWTD) is to demonstrate, operationally assess, rapidly deploy, and transition capability solutions and innovative concepts to address the joint, coalition and interagency operational gaps and shortfalls. The Combatant Commands drive SWTDs through their stated operational priorities and needs, which are applied to an agile acquisition process that yields results years ahead of traditional material development cycles.

The SWTD will demonstrate robust, end-to-end kill chains of enemy surface combatants. Intelligence Surveillance and Reconnaissance (ISR) platforms will include the USAF E-8 Joint Surveillance Targeting Attack Radar System (JSTARS) and the USN P-3 Littoral Surveillance Radar System (LSRS). The launch platform will be the FA-18 Hornet. Weapons will include the AGM-154C Joint Stand-off Weapon (JSOW-C-1), AGM-84M Harpoon Block III, and the AGM-84K Stand-off Land Attack Missile-Expanded Response (SLAM-ER). In the case of the SLAM-ER, the FA-18 will translate ISR Link-16 targeting information and transmit that information to the SLAM-ER with J3.3/J3.5 messages via the AWW-13 pod. By implication, USN Harpoon-equipped surface combatants will be capable of employing their surface-launched Harpoons in a similar fashion. The focus will be on in-flight targeting messages going directly from the ISR platforms to the weapons themselves.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0604659N, Precision Strike Weapons Development Program	3215, Strike Weapons Technology Demonstration

B. Accomplishments/Planned Program

JSUW Demonstration	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	12.416	
RDT&E Articles Quantity				

The SWTD will exploit the success of the Weapons Data Link Network (WDLN) Advanced Concept Technology Demonstration (ACTD) and its networking protocols by integrating the WDLN messages into Intelligence Surveillance and Reconnaissance platforms; the launch platform and weapons will integrate the messages as part of their programs of record. Platform modifications will be centered around the integration of the WDLN messages (hereafter referred to as the Net-Enabled Weapon (NEW) messages) into aircraft mission computers to transmit and receive joint targeting data. Weapon modifications (outside of JSuW SWTD funding but included as part of the capability) include the avionics changes necessary to transmit and receive the WDLN message set to enable targeting of surface ships.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	0604659N, Precision Strike Weapons Development Program	3215, Strike Weapons Technology Demonstration

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010

Not Applicable

D. ACQUISITION STRATEGY:

The contracting strategy for JSuW SWTD is planned to be sole source for the duration of the demonstration. Cost type contracts will be utilized with Raytheon for Littoral Surveillance Radar System, and Northrop Grumman for Joint Surveillance Targeting Attack Radar System (JSTARS). In addition, funds will be provided to the current Programs of Record contracts for JSOW (Raytheon, Tucson Arizona), Harpoon (Boeing, St. Charles, Missouri), and F/A-18E/F (Boeing, St. Louis, Missouri).

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0604659N, Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3215, Strike Weapons Technology Demonstration						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Product Development												
Primary Hardware Development	SS/CPFF	Raytheon, Dallas, TX				3.868	12/09					
Primary Hardware Development	SS/CPFF	Northrup Grumman, Melbourne, FL				2.881	12/09					
Primary Hardware Development	WX	CINCPACFLT, HI				0.300	12/09					
Subtotal Product Development						7.049						
Remarks:												
Support												
Software Development	WX	NAWCWD, China Lake, CA				0.240	11/09					
Software Development	SS/CPFF	Raytheon, Tucson AZ				0.395	12/09					
Software Development	SS/CPFF	Boeing, St. Charles, MO				0.990	12/09					
Subtotal Support						1.625						

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**		PROGRAM ELEMENT 0604659N, Precision Strike Weapons Development Program				PROJECT NUMBER AND NAME 3215, Strike Weapons Technology Demonstration						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Test & Evaluation												
Developmental Test & Evaluation	WX	NAWCWD, China Lake, CA				0.966	11/09					
Developmental Test & Evaluation	WX	COMOPTEVFOR, Norfolk VA				0.450	11/09					
Subtotal T&E						1.416						
Remarks:												
Management												
Contractor Engineering Support	RX	NAVSEA, Washington, DC				0.310	11/09					
Government Engineering Support	WX	NAWCWD, China Lake, CA				1.150	11/09					
Government Engineering Support	WX	NAWCAD, Patuxent River, MD				0.466	11/09					
Government Engineering Support	MP	Air Force ACC, Eglin AFB, FL				0.400	11/09					
Subtotal Management						2.326						
Remarks:												
Total Cost						12.416						
Remarks:												

R-1 SHOPPING LIST - Item No. 78

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-4	0604659N, Precision Strike Weapons Development Program	3215, Strike Weapons Technology Demonstration	

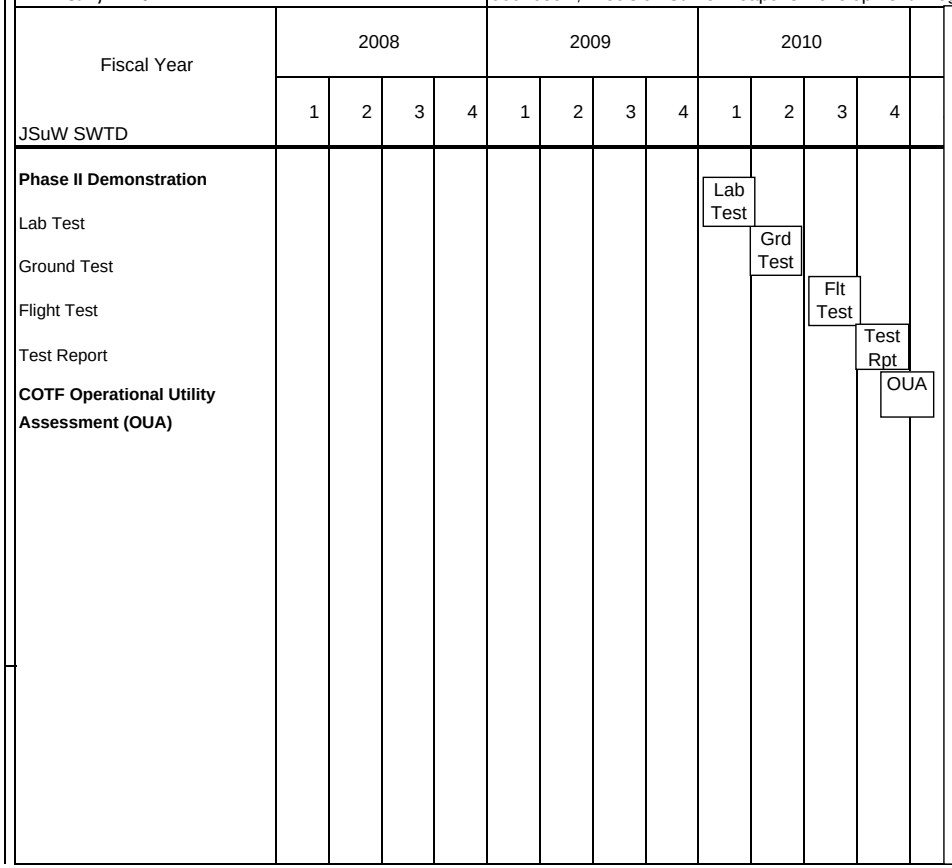


Exhibit R-4a, Schedule Detail						DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E,N / BA-4	0604659N Precision Strike Weapons Development Program				3215, Strike Weapons Technology Demonstration			
Schedule Profile-JSuW SWTD	FY 2008	FY 2009	FY 2010					
Lab Test			1Q					
Ground Test			2Q					
Flight Test			3Q					
Test Report			4Q					
COTF Operational Utility Assessment (OUA)			4Q					

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-2

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT

COST: (Dollars in Millions)

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Total PE	40.401	48.116	42.533
0798 OTH TARGETING	2.056	1.896	0.923
2144 SPACE & ELEC WARFARE ENGINEERING	8.180	14.610	11.078
2357 MARITIME BATTLE CENTER	30.165	30.812	30.532
9999 CONGRESSIONAL PLUS-UPS	0.000	0.798	0.000

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) contains three projects: Maritime Battle Center (MBC), Over-the-Horizon Targeting (OTH-T), and Space and Electronic Warfare (SEW) Engineering. The MBC project (2357) focuses on Fleet experimentation in order to eliminate warfighting gaps and validate Navy Concept of Operations (CONOPS) and Doctrine coordinated by the Navy Warfare Development Command (NWDC). The MBC also manages US Fleet Forces Command's (USFFC) Sea Trial program of Fleet experimentation that is administered by the Sea Trial Executive Steering Group (STESG). Both MBC and Sea Trial integrate emergent concepts and technologies through experiments/analysis/modeling and simulation to support warfighting capability development. Sea Trial experimentation is dedicated to providing solutions to near term (within the Fiscal Year Defense Plan) warfighting gaps through focused Operational Agent (Commander Second Fleet, Commander Third Fleet and Commander Naval Network Warfare Command) led experimentation. The USFFC chaired Flag level Sea Trial Executive Steering Group prioritizes proposed Sea Trial experiments annually. The MBC will also serve as the Navy representative to the Joint Battle Center and the Battle Labs of other services.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT

The OTH-T and SEW Engineering projects (0798 and 2144 respectively) are systems engineering non-acquisition programs to develop, test, implement Technical Authority, and validate Naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures to support naval missions in the Joint and Coalition Theater. The mission of these projects are carried out by multiple tasks that are used to ensure Naval C4ISR Command and Control Warfare (C2W) components of SEW are effectively integrated into service-oriented architecture delivering net centric warfare capability. Additionally, these projects ensure that (1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the Naval C4ISR architecture and enhance warfighting capability as related to the objectives of National Defense Strategy and evolving joint visions and direction, such as Joint Vision 2020 (JV 2020), "Sea Power 21" and "Net-Centric Capability" and are guided by warfighter requirements; and (2) that SEW systems and systems integration efforts involve leading-edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (GOTS/COTS) products to enhance the Navy's operational capability, interoperability, warfighter effectiveness, flexible reconfiguration, as well as reduce costs; and (3) that SEW systems integration efforts promote the delivery of FORCEnet and the Navy's contribution to the Global Information Grid (GIG).

The SEW Engineering project (2144) also includes efforts supporting the Maritime Domain Awareness (MDA) program. MDA is "the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy, or environment of the United States." MDA can only be achieved through the combined efforts of federal, state, and local government agencies, international governments, and commercial and private enterprise. MDA is a key enabler for maritime security; as well as counter-piracy, counter-drug, freedom of navigation, counter-terrorism, humanitarian assistance and disaster relief, stability, and major combat operations.

Due to the number of efforts in this PE, the programs described are representative of the work included in this PE.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT

B. PROGRAM CHANGE SUMMARY:

	FY 2008	FY 2009	FY 2010
Previous President's Budget	41.592	47.518	51.231
Congressional Program Reductions	0.000	-0.191	0.000
Program Adjustments	0.000	0.000	-8.687
Rate/Misc Adjustments	0.000	-0.011	-0.011
SBIR/STTR Transfer	-0.191	0.000	0.000
Total Congressional Increases	0.000	0.800	0.000
Total Reprogrammings	-1.000	0.000	0.000
Current BES/President's Budget	40.401	48.116	42.533

PROGRAM CHANGE SUMMARY EXPLANATION:
Technical: Not applicable

Schedule: Not applicable

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable

E. PERFORMANCE METRICS:
Maritime Battle Center:
- Refine concepts and identify key performance levels necessary for implementation.
- Demonstrate feasibility and discriminate among competing concepts and implementation alternatives.
- Understand potential military effectiveness and risk.
- Evaluate how much of the new capability and attendant force structure is needed.
- Learn how to operate the new force and combine it with the legacy force.
- Develop recommended Doctrine, Organization, Training, Material, Leadership, and Personnel (DOTMLP) changes.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT

- Develop fleet warfighting requirements for submission to the OPNAV Navy Capabilities Development Process (NCDP) to inform Navy acquisition decisions.
- Integrate emergent concepts and technologies, leading to rapid introduction of needed warfighting capabilities in the fleet.
- Rapidly mature Sea Shield, Sea Strike, Sea Basing, and FORCEnet concepts, technologies, and doctrine.
- Focus on near, mid and long term warfighting challenges to realize increased warfighting effectiveness.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

COST: (Dollars in Millions)

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
0798 OTH TARGETING	2.056	1.896	0.923

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The OTH-T/Allied Interoperability program provides a virtual, global systems integration and test facility for C4ISR technology that supports the collection, transmission, correlation, and display of track data into Common Operational and Tactical Pictures (COTP) in support of warfighting requirements. The common view of the battle space applies across the spectrum of warfare missions. However, technology and doctrine has changed radically. The first objective of the OTH-T/Allied Interoperability program is to transition the Joint/Navy architectures and systems to state-of-the-art COTS and GOTS products that support Network Centric Warfare. The second objective is to support development, integration, and joint interoperability of all National Security System (NSS), Information Technology (IT), and C4I systems into warfighting capabilities. This support includes providing technical expertise afloat and ashore via a cadre of highly trained Fleet Systems Engineers in order to integrate, validate, and evaluate new OTH-T/Allied Interoperability capabilities during major Fleet exercises and demonstrations. The OTH-T/Allied Interoperability program integration and testing in support of warfighting capabilities includes joint and coalition interoperability testing for C4ISR equipment. Coalition and joint interoperability is an important issue for future naval operations, especially with the Navy initiative to expand Internet Protocol (IP) networking throughout the Fleet Navy Marine Corps Intranet/Base Level Information Infrastructure (NMCI/BLII) with the GIG. Currently, IP connectivity with Coalition forces is limited, requiring extensive backhaul through ashore infrastructure. Funding allows for development of solutions for emerging Coalition and joint interoperability requirements. Data throughput needs to be increased for the exchange of large size files within the limitations of high frequency (HF) and ultra-high frequency (UHF) mediums in support of, for example, Collaboration at Sea (CAS) and Maritime Domain Awareness (MDA). Funding allows for further development of potential solutions for merging improved transmission control protocol/internet protocol (TCP/IP) capability with advance digital network systems (ADNS) and existing international standards (e.g. Standardization Agreement 5066). Funding will also allow for development of Subnet Relay and other tactical networking technologies and protocols as well as automatic link establishment standards, which provides for a significant improvement within, and between, battle groups.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
ADVANCED RELAY/WIRELESS/ANTENNA TECHNOLOGIES	0.731	0.778	0.723

FY 2008 Accomplishments:

Designed, fabricated, and tested Generation 4 Spatially Aware Wireless Networking (SPAWN) prototype antennas in seaworthy brassboard form with wireless network equipment. Performed a line-of-sight (LOS) field demonstration of SPAWN in Trident Warrior 2008.

FY 2009 Plans:

Design, fabricate and test Generation 5 SPAWN antennas in integrated form with wireless network equipment. Perform an Over-the-Horizon (OTH) field demonstration of SPAWN in Trident Warrior 2009.

FY 2010 Plans:

Design, fabricate and test Generation 6 SPAWN antennas in an integrated form with wireless network equipment. Perform an Over-the-Horizon (OTH) field demonstration of SPAWN in Trident Warrior or similar venue to include airborne relay platforms for a demonstration of high bandwidth Naval Tactical Networking. The demonstration will also include the integration of advanced relay technology with mobile ad hoc network (MANET) controllers and High Assurance Internet Protocol Encryption (HAIPE) devices on CENTRIXS. Develop advanced routing, application and Information Assurance/Computer Network Defense (IA/CND) architectures and solutions for the coalition Naval Tactical Networking (NTN) environment that maximize network efficiency using multiple, dissimilar bearers.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

	FY 2008	FY 2009	FY 2010
INTEROPERABILITY VALIDATION	0.182	0.153	0.000

FY 2008 Accomplishments:

- Used the Reconfigurable Land Based Sites (RLBTS) and Over-the-Horizon Targeting (OTH-T) resources to validate Global Information Grid (GIG) technologies prior to shipboard installation, supported ten Net Ready-Key Performance Parameters (NR-KPP) Migration Plan Developments and four joint interoperability C4ISR certifications, ensured interoperability requirements between sensors, weapon systems and information systems were met.

FY 2009 Plans:

- Continue to use the RLBTS and OTH-T resources to validate GIG technologies prior to shipboard installation, support ten NR-KPP Migration Plan Developments and four joint interoperability C4ISR certifications to ensure interoperability requirements between sensors, weapon systems and information systems are met.

	FY 2008	FY 2009	FY 2010
SUBNET RELAY	0.194	0.209	0.200

FY 2008 Accomplishments:

- Continued to refine Subnet Relay allied interoperability in concert with Chief of Naval Operations for Communication Networks. Venues of opportunity were exploited to validate and evaluate developed portions of Subnet Relay configurations through testing, trials, and demonstrations. Investigated airborne deployment of Subnet Relay.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

FY 2009 Plans:

- Continue to refine Subnet Relay allied interoperability in concert with the Office of the Chief of Naval Operations. Venues of opportunity will be exploited to validate and evaluate developed portions of Subnet Relay configurations through testing, trials, and demonstrations. Complete field demonstration of Subnet Relay airborne deployment.

FY 2010 Plans:

- As a part of the refinement of Subnet Relay allied interoperability in concert with Office of the Chief of Naval Operations, develop interoperable wide-band ultrahigh frequency (UHF) solutions to enhance throughput and progress the standardization of Subnet Relay into a Standard NATO Agreement (STANAG). Exploit venues of opportunity to evaluate and validate developed portions of Wide-Band Subnet Relay configurations through testing, trials and demonstrations.

	FY 2008	FY 2009	FY 2010
SYSTEMS INTEGRATION & INTEROPERABILITY TESTING	0.521	0.418	0.000

FY 2008 Accomplishments:

- Conducted/participated in five overall Joint/Navy integration and interoperability tests as available; facilitated two planning reviews for Joint Test and Evaluations as available; participated in the Joint Users Interoperability Communications Exercise (JUICE), Joint Distributed Engineering Plant (JDEP), and other joint test events.

FY 2009 Plans:

- Continue to conduct/participate in five overall Joint/Navy integration and interoperability tests as available; facilitate two planning reviews for Joint Test and Evaluations as available; participate in JUICE, JDEP, and other joint test events.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

	FY 2008	FY 2009	FY 2010
TESTING OTH-T SYSTEMS	0.428	0.338	0.000

FY 2008 Accomplishments:

- Conducted six developmental, integration, and certification tests of OTH-T and combat systems with tactical data exchanged over Common Operational Picture (COP) Common Synchronization Tools (CST) networks and other networks; three integration test events for Joint Command and Control, Combat Decision Systems, and Collaboration technologies within the GIG. Tested to also address issues of Fleet essential capabilities and emerging mission essential needs both for new, legacy, and technology refreshed systems. This included developmental testing between Joint C2 systems and combat systems.

FY 2009 Plans:

- Continue to conduct six developmental, integration, and certification tests of OTH-T and combat systems with tactical data exchanged over COP CST networks and other networks; three integration test events for Joint Command and Control, Combat Decision Systems, and Collaboration technologies within the GIG. Testing to also address issues of Fleet essential capabilities and emerging mission essential needs both for new, legacy, and technology refreshed systems. This includes developmental testing between Joint C2 systems and combat systems.

C. OTHER PROGRAM FUNDING SUMMARY - NAVY RELATED RDT&E:
Not applicable.

OTHER PROGRAM FUNDING SUMMARY - NON-NAVY RELATED RDT&E:

D. ACQUISITION STRATEGY:
Not applicable.

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-3

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 0798 PROJECT TITLE: OTH TARGETING

Exhibit: R-3 Cost Analysis APPROPRIATION/BUDGET ACTIVITY: RDT&E, N / BA 4						Date: May 2009 PROJECT NAME and NUMBER: OTH Targeting 0798						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-09 Cost	FY-09 Award Date	FY-10 Cost	FY-10 Award Date			CostToComp	Total Cost	Target Value of Contract
Advanced Relay/ Wireless / Antenna Technologies	Various	Various	5.704	.778	Various	.725	Various			CONT	CONT	
Interoperability Requirements	Various	Various	3.266								3.266	
T & E Tools Development	Various	Various	0.429								.429	
Systems Int. & Interop. Testing (LBTN)	Various	Various	3.590	.418	Various	0.000	Various			CONT	CONT	
Interoperability Validation	Various	Various	2.647	.153	Various	0.000	Various			CONT	CONT	
Joint Interoperability	Various	Various	1.174								1.174	
Testing OTH-T Systems	Various	Various	2.850	.338	Various	0.000	Various			CONT	CONT	
Subtotal T&E			19.660	1.687		.725				CONT	CONT	
Remarks												
Contractor Engineering Support											0.000	
Subnet Relay	Various	Various	4.702	.209	Various	.198	Various			CONT	CONT	
Program Management Support	Various	Various	1.468								1.468	
Travel											0.000	
Transportation											0.000	
Subtotal Management			6.170	.209		.198				CONT	CONT	
Remarks												
Total Cost			25.830	1.896		.923				CONT	CONT	

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 2144 PROJECT TITLE: SPACE & ELEC WARFARE ENGINEERING

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
2144 SPACE & ELEC WARFARE ENGINEERING	8.180	14.610	11.078

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: OPNAVINST 3050.23 defines the policy to fuse validated/approved Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures and interoperability requirements with requirements, milestones and program decisions. C4ISR integrated architectures/requirements are the underpinnings for all C4ISR mission areas and capabilities and, as such, requirements and acquisition processes have been reengineered to use these Integrated Architectures for decisional purposes and strategic planning. Furthermore, Office of the Secretary of Defense (OSD) has defined key programs/efforts Global Information Grid (GIG) Baseline Extension (BE), Transformational Satellite (TSAT), Joint Tactical Radio System (JTRS), Network Centric Enterprise Services (NCES), Information Assurance (IA) and standards that will drive and change the Navy's C4ISR integrated architectures and associated business processes for requirements, budgets and acquisition. To that end, the SEW provides two main functions: 1) Development of C4ISR Integrated Architecture Products and 2) Supporting C4ISR Systems Engineering processes and standards. The integrated architecture products are used to support the Navy's C4ISR budget process by providing the critical core architecture and enabling capabilities to the Warfighter. The C4ISR systems engineering processes and standards provide the construct for distributed C2 interoperability requirements analyses to identify capability shortfalls/gaps and for systems engineering to compare/test alternatives in a joint end-to-end environment while identifying associated Navy wide C4ISR implications. Processes include developing and applying criteria for use in Systems Engineering Technical Reviews mandated by Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA) and providing technical input to governance bodies such as the FORCEnet Coordination Council and the Information Technology Management Council. This includes Human Systems Integration (HSI) to provide a mission-centered orientation to ensure effective operational employment of fielded capability. As joint concepts and OSD driving efforts/programs are matured/defined the Navy's C4ISR integrated architectures are refined and the supporting C4ISR Systems Engineering processes and standards work to engineer and enact C4ISR implementations Navy wide across all C4ISR mission areas.

The SEW Engineering project supports the Maritime Domain Awareness (MDA) program. MDA is "the effective understanding of anything associated with the global maritime domain that could impact the security, safety,

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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economy, or environment of the United States." MDA can only be achieved through the combined efforts of federal, state, and local government agencies, international governments, and commercial and private enterprise. MDA is a key enabler for maritime security; as well as for counter-piracy, counter-drug, freedom of navigation, counter-terrorism, humanitarian assistance and disaster relief, stability, and major combat operations.

Products provided:

1) C4ISR Integrated Architectures
- Integrated Architectures and Standards - Architecture Views (Operational Views, Service Views, Technical Views, System Views)
- Migration Roadmaps to the target Architectures
- Architecture technical authority, studies, interpretation assistance, and white papers

2) Supporting C4ISR Systems Engineering processes
- Distributed C2 Interoperability Requirement Analysis – Gaps Analysis, Overlap Analysis, System Priority Lists, C4ISR Metrics and Models, Analysis of Alternatives, Requirements Database, Assessment Repository, Resource Implications Studies, Baseline Performance Models, Mission Task Analysis, Human Systems Integration (HSI) assessments.
- End-to-End Systems Engineering and Integrated Design – Operational feasibility studies, technical feasibility studies, technical roadmap engineering validations, Architectures and Assessment traceability matrices.
- Joint and Coalition interoperability trials – Joint end-to-end prototyping trials, and Joint/Coalition interoperability demonstrations, Interoperability assessments and metrics, Interoperability studies via the Coalition Warrior Interoperability Demonstration (CWID) and the Joint Rapid Architecture Experimentation (JRAE) process. Chairman of the Joint Chiefs of Staff Instruction 6260.01B (CJCSINST 6260.01B) directs the USN to provide $1.7 million to the general CWID operating budget and to participate by operating a US Navy demonstration site.

3) Compliance and alignment reports with Navy Enterprise Architecture/Data Strategy and Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA) system engineering policies generated during Systems Engineering Technical Reviews.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
C4ISR ARCHITECTURE AND STANDARDS	0.517	0.147	0.000

FY 2008 Accomplishments:

- Implemented technical authority for architecture and standards across Program Executive Office C4I systems.
- Provided architecture data to support required analyses, testing, modeling and simulation.
- Updated technical and system data.
- Produced system architecture products as required in support of programming decisions.
- Provided various white papers and studies as needed to develop architecture products.

FY 2009 Plans:

- Implement technical authority for architecture and standards across Program Executive Office C4I, PEO Space and PEO-IT systems.
- Conduct spiral development of the FORCEnet Integration Architecture including Operational, System, Service and Technical Views.
- Conduct technical analysis to review Joint Capabilities Integration and Development System (JCIDS) documentations.

FY 2010 Plans:

- Combined with C4ISR Systems Engineering

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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	FY 2008	FY 2009	FY 2010
C4ISR SYSTEMS ENGINEERING	0.000	0.000	5.254

FY 2010 Plans:

- Department of Navy (DoN) C4ISR Transformation/Strategic Planning within DoN/Joint/Department of Defense (DoD) Framework: Assesses existing and emerging capabilities, develops and evaluates Navy-wide policies, plans, requirements, and compliance; develops integration and investment strategies; and accelerates innovation, testing, assessment and fielding of material and non-material solutions for enhanced operational capability, Joint/Allied/Coalition interoperability and application/enforcement of enterprise requirements/architectures/standards toward greater Net-Centric Operations/Warfare (NCO/W) capability.

- Implementing and validating FORCEnet requirements: Perform Systems Engineering Technical Reviews (SETR) utilizing validated assessment tools, system engineering methodologies and Compliance Action Lists (CALs) to ensure standard engineering processes (e.g., information assurance, data strategy, architecture, modeling, status of action (SOA) development) are being developed and utilized to ensure FORCEnet compliance.

	FY 2008	FY 2009	FY 2010
COALITION WARRIOR INTEROPERABILITY DEMONSTRATION (CWID)	2.504	2.000	1.290

FY 2008 Accomplishments:

- Continued to investigate solutions for known capability gaps. While the Combatant Command (COCOM) executive agent for CWID 2008/2009 had not been identified, it was clear that both Allied Interoperability and Homeland Defense (HLD)/Homeland Security (HLS) inter-governmental agency interoperability remained cornerstones of the CWID charter. Space and Naval Warfare Systems Command (SPAWARSYSCOM) remained the USN site and continued to host both Coalition and HLD/HLS venues.

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PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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FY 2009 Plans:

- Continue to investigate solutions for known capability gaps. While the COCOM executive agent for CWID 2009 has not been identified, it is clear that both Allied Interoperability and Homeland Defense (HLD)/Homeland Security (HLS) inter-governmental agency interoperability will remain cornerstones of the CWID charter. Chairman of the Joint Chiefs of Staff Instruction 6260.01B requires each Service to provide $1.7 million for CWID participation. The remaining $300K is required for SPAWARSYSCOM representation to the Coalition portion of the CWID 09 venue.

FY 2010 Plans:

- Coalition Warrior Interoperability Demonstration (CWID) will de-scope its current Joint/Navy effort to focus exclusively on Joint capability gaps. As directed by the CWID Joint Management Office, funding will be provided to the various Joint organizations for execution of the Joint portions of the CWID effort.

- The Navy site will evaluate known Navy capability gaps and will perform demonstration management, planning, installation/de-installation, security certification and accreditation, infrastructure (Networks, Crypto, laboratories, etc.), data collection and analysis, final report, and documentation.

	FY 2008	FY 2009	FY 2010
DISTRIBUTED C2 INTEROPERABILITY REQUIREMENTS ANALYSIS	2.155	0.992	0.000

FY 2008 Accomplishments:

- 2016-2022 Model C4ISR architectures for 3 Major Combat Operations / Mission areas in support of force level assessments for 5 Navy analytic issues / Capability Based Assessments (CBA). Supported NCW Level 2 block builds.

FY 2009 Plans:

- 2020-2026 Model C4ISR architectures for 3 Major Combat Operations / Mission areas in support of force level assessments for 5 Navy analytic issues / Capability Based Assessments (CBA). Support NCW Level 3 block builds. FORCEnet Capability List (FCL) efforts will continue to develop a web-based software system required

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PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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to implement the FCL. It will provide the direct correlation of joint interoperable capabilities to activities, functions, and systems mapped to Mission Essential Tasks (METs). It will provide linkages to the metrics assessing value of systems relevance to joint interoperable capability, functions, and associated tasks and activities.

FY 2010 Plans:

- Combined with C4ISR Systems Engineering

	FY 2008	FY 2009	FY 2010
END-TO-END SYSTEM ENGINEERING AND INTEGRATED DESIGN	0.704	0.147	0.000

FY 2008 Accomplishments:

-Provided systems engineering support to apply end-to-end integrated architectures across the Naval Enterprise.
-Supported Team SPAWAR PMs in development of JCIDS documents, Integrated Support Plans (ISPs) and NR-KPPs.
-Provided training for Team SPAWAR personnel on how to meet interoperability certification requirements.
-Continued development of the Composeable Test Environment (CTE) effort with emphasis on linking Team SPAWAR labs and facilities to Naval Enterprise labs and facilities.
-Worked with ASN RDA on implementation of the Interoperability and Integration Management Plan (I&IMP).

FY 2009 Plans:

-Continue to provide systems engineering support to apply end-to-end integrated architectures across the Naval Enterprise.
-Support Team SPAWAR PMs in development and implementation of Joint Capabilities Integration and Development System (JCIDS) documents, ISPs and NR-KPPs through the Systems Engineering Technical Review (SETR) process.
-Continue to provide training for Team SPAWAR personnel on how to meet interoperability certification requirements.
-Begin implementation of the CTE CONOPS/effort with emphasis on linking Team SPAWAR labs and facilities to Naval Enterprise labs and facilities.
-Continue to work with ASN RDA on implementation of the I&IMP.

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PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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FY 2010 Plans:

- Combined with C4ISR Systems Engineering

	FY 2008	FY 2009	FY 2010
JOINT RAPID ARCHITECTURE EXPERIMENTATION (JRAE)	0.300	0.300	0.000

FY 2008 Accomplishments:

- JRAE efforts were driven by Joint Forces Command (JFCOM) interoperability risk areas at the horizontal (tactical) level as identified by the Joint Architecture efforts under the JFCOM Joint Battle Management Command and Control (JBMC2). The JRAE process was used to prototype the “to be” joint integrated architectures, and integrated and collaboratively tested with the Army and the Air Force to promote joint interoperability between the Services’ next generation tactical Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures.

FY 2009 Plans:

- Navy will continue to provide representation to Joint Rapid Architecture Experimentation (JRAE) activities and will collaborate with the Joint Community and Defense Agencies in identifying interoperability risk areas for Service Oriented Architectures.

	FY 2008	FY 2009	FY 2010
MARITIME DOMAIN AWARENESS (MDA)	2.000	7.039	0.000

FY 2008 Accomplishments:

Architecture:
- Operational Views (OV) 1, 4, 5 & 6 completed.
- System Views (SV) 1, 2 & 6 completed.
- Architecture View (AV) 1 final.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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Certifications & Accreditations:
- IATOs (Interim Authority to Operate) approved: Comprehensive Maritime Awareness (CMA), Google and Extended-Maritime Interdiction Operations (E-MIO) Assured Database Server.
- ATOs (Authority to Operate) approved: Maritime Awareness Global Network (MAGNET), Sensor Management System (SMS), MDA Data Sharing Community of Interest and Tripwire.- Interim Certificate to Operate (ICTO) approved.
-Interim Certificate to Operate (ICTO) approved.

FY 2009 Plans:

Provide systems engineering support for the MDA acceleration initiative to include:
- Architecture Development
- Risk reduction, data collection and analysis
- Requirements generation and validation
- Capability demonstrations Coalition Warrior Interoperability Demonstration (CWID), Joint Rapid Architecture Experimentation (JRAE), Joint Capabilities Technology Demonstration (JCTD), Advanced Concept Technology Demonstration (ACTD)
- Fleet experimentation
- Fielding of prototypes and transition of successful prototypes to programs.

	FY 2008	FY 2009	FY 2010
SYSTEMS ENGINEERING AND INTEGRATION REVITALIZATION	0.000	1.110	1.270

FY 2009 Plans:

- Develop and improve systems engineering models, tools, and databases to improve the quality of C4ISR products.
- Develop the Systems Engineering Technical Review database.
- Initiate the systems engineering plan e-Builder.
- Initiate the measurement repository and analysis database.

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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FY 2010 Plans:

- Certify competency standards for systems engineering qualification.
- Increase access to systems engineering training resources.
- Deliver an assessment of systems engineering capability and recommend improvements.

	FY 2008	FY 2009	FY 2010
SYSTEMS ENGINEERING STANDARDS AND PROCESSES	0.000	2.875	3.264

FY 2009 Plans:

- Develop prototypes and excursions of emerging C4ISR systems for use in potential product enhancements.
- Integrate existing technologies in novel ways to substantially increase systems capabilities at low risk.
- Combine existing stovepiped data systems into integrated operational pictures across programs of record.
- Enable excursions from existing ISR systems to use existing sensors to solve non-traditional problems.
- Reduce network bandwidth overhead and inefficiencies.

FY 2010 Plans:

- Improve process for using modeling and simulation in Systems Engineering Technical Review.
- Develop processes, model, and collect data to link probability of program success to systems engineering performance.
- Improve linkage between requirements analysis and enterprise architecture products.

C. OTHER PROGRAM FUNDING SUMMARY - NAVY RELATED RDT&E:
Not applicable.

OTHER PROGRAM FUNDING SUMMARY - NON-NAVY RELATED RDT&E:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable.

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-3

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 2144 PROJECT TITLE: SPACE & ELEC WARFARE ENGINEERING

Exhibit: R-3 Cost Analysis (page 1 of 2)						Date: May 2009						
APPROPRIATION/BUDGET ACTIVITY: RDT&E, N / BA 4						PROJECT NAME and NUMBER: SEW Engineering 2144						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-09 Cost	FY-09 Award Date	FY-10 Cost	FY-10 Award Date			CostToComp	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			0.000	0.000		0.000				0.000	0.000	
Remarks												
Development Support	Various	Various	4.554								4.554	
SEW/C4I Technology Integration	Various	Various	12.985								12.985	
MDA Prototype SE Support	Various	Various	4.500	7.039	Various	0.000				CONT	CONT	
Systems Engineering & Integration Revitalization	Various	Various		1.110	Various	1.270	Various			CONT	CONT	
Systems Engineering Standards & Processes	Various	Various		2.875	Various	3.264	Various			CONT	CONT	
Systems A&E and Validation	Various	Various	13.188								13.188	
Distributed C2 Interoperability Requirement Analysis	Various	Various	15.520	.992	Various	0.000				CONT	CONT	

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-3

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
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Exhibit: R-3 Cost Analysis (page 2 of 2) Date: May 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, N / BA 4 PROJECT NAME and NUMBER: SEW Engineering 2144

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-09 Cost	FY-09 Award Date	FY-10 Cost	FY-10 Award Date	-		CostToComp
C4ISR Architecture and Standards	Various	Various	14.111	.147	Various	0				CONT
End-to-End System Engineering and Integrated Design	Various	Various	10.837	.147	Various	0				CONT
Info. Repository/Naval Architecture	Various	Various	4.000							
Navy Collaborative										
C4ISR Systems Engineering	Various	Various				5.254	Various			CONT
Subtotal Support			79.695	12.310		9.788				
Remarks										
SEW Eng/CWID	Various	Various	26.965	2.000	Various	1.290	Various			CONT
SEW Eng/JRAE	Various	Various	15.688	.300	Various	0				CONT
Subtotal T&E			42.653	2.300		1.290				
Remarks										
Contractor Engineering Support										
Government Engineering Support										
Program Management Support										
Travel										
Transportation										
Subtotal Management			0	0		0				
Remarks										
Total Cost			122.348	14.610		11.078				

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-2a

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 2357 PROJECT TITLE: MARITIME BATTLE CENTER

Project Number & Title	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
2357 MARITIME BATTLE CENTER	30.165	30.812	30.532

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission of the Maritime Battle Center (MBC), a department within the Navy Warfare Development Command (NWDC), is the development of new or improved warfighting capabilities through Sea Trial, the Fleet's experimentation process. The MBC's program evaluates and validates emerging Navy Concept of Operations (CONOPS), Doctrine and technologies through focused experimentation, rigorous analysis and assessment. Sea Trial experimentation, on the other hand, is dedicated to providing solutions to near term (within the Fiscal Year Defense Plan) war fighting gaps. The US Fleet Forces Command (USFFC) chairs the Flag level Sea Trial Executive Steering Group (STESG). It is the STESG that prioritizes and approves the Sea Trial's annual Execution Plan (ExPlan).

The Maritime Battle Center acts as the executive agent to conduct and coordinate experiments that are focused on both technological and non-technological solutions to warfighting gaps across all naval warfare areas. The MBC is involved in all facets of experimentation including planning, systems engineering and integration, execution, data collection, analysis, and assessment for fleet experiments, limited objective experiments (LOEs), limited technical experiments (LTEs), wargames, seminars and workshops. The MBC supports the early and sustained involvement of Joint Warfighters in refining the technologies and the tactics, techniques, and procedures (TTP) needed in the Joint fight.

This program historically does not meet established execution benchmarks. MBC experimentation differs from other Research, Development, Test and Evaluation (RDT&E) programs because it is based upon Fleet operational availability vice independently scheduled through warfighting labs. Because Fleet experimentation frequently must occur during the spring/summer operational schedules, the overall RDT&E obligation/expenditure rates do not align with OSD practice. As a result, MBC's obligation rates do not begin to approach benchmark until the program nears the fiscal year's end while its expenditure rates generally do not approach benchmark until midway through the second year of its appropriation.

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
FBE ANALYSIS AND CORE SUPPORT	30.165	30.812	30.532

Because of the synergistic relationship between NWDC's Maritime Battle Center experimentation efforts and the Fleet's Sea Trial experimentation efforts, funding for both endeavors have been combined under one project, the Maritime Battle Center. The Sea Trial aspect of this project's mission is driven by the priorities of the designated Operational Agents – Commander Second Fleet for Sea Strike and Seabasing, Commander Third Fleet for Sea Shield, and Commander Naval Network Warfare Command for FORCEnet. The priorities of these Operational Agents are further prioritized and approved by the Sea Trial Executive Steering Group (STESG) in conjunction with Commander U.S. Fleet Forces.

FY 2008 Accomplishments:

- Continued participation in Joint Forces Command experimentation continuum
- Continued Limited Objective Experiments
- Continued CONOPS Development validation events
- Initiated and executed Sea Trial Experiments, War Games, and Seminars
- Completed the FY 08 spiral of the multi-year series of Maritime and Joint Fires experiments
- Completed the FY 08 spiral of the multi-year series of Surface Ship Periscope Detection experiments
- Completed the FY 08 spiral of the multi-year series of Fusion/Correlation experiments
- Completed the FY 08 spiral of the multi-year series of Net-Centric Environment Services/Service Oriented Architecture (NCES/SOA) experiments
- Completed the FY 08 spiral of the multi-year series of Sensor Integration experiments
- Completed the FY 08 spiral of the multi-year series of C2/Collaboration experiments
- Completed the FY 08 spiral of the multi-year series of Cross Domain Solution experiments
- Completed the FY 08 spiral of the multi-year series of Information Assurance/Computer Network Defense (IA/CND) experiments
- Completed the FY 08 spiral of the multi-year series of Communications at Speed and Depth experiments
- Completed the FY 08 spiral of the multi-year series of Offensive Information Operations experiments
- Completed the FY 08 spiral of the multi-year series of Information Management/Knowledge Management (IM/KM) experiments

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- Completed the FY 08 spiral of the multi-year series of Electronic Warfare (EW) Improvements experiments
- Completed the FY 08 spiral of the multi-year series of Network Instrumentation/Visualization experiments
- Completed the FY 08 spiral in the multi-year series of Maritime Headquarters with Maritime Operations Center experiments
- Completed the FY 08 spiral in the multi-year series of Command and Control, Maritime Domain Awareness experiments
- Completed the FY 08 spiral in the multi-year series of Networking of the Maritime Operations Centers experiments
- Completed the FY 08 spiral in the multi-year series of Network Operations, Information Operations, and Space Support experiments
- Completed the FY 08 spiral in the multi-year series of Coalition Operations experiments
- Completed the FY 08 spiral in the multi-year series of Maritime Dynamic Targeting experiments
- Completed the FY 08 spiral in the multi-year series of Airborne Tactical Internet Protocol Networks experiments
- Completed the FY 08 spiral of the multi-year series of Littoral Combat Ship Mine Counter Measures Modular Mission Packages experiments
- Completed the FY 08 spiral of the multi-year series of Tactical Tomahawk Third Party Targeting experiments
- Completed the FY 08 spiral of the multi-year series of Bandwidth Optimization experiments
- Completed the FY 08 spiral of the multi-year series of TAPA Electronic Warfare Anti Ship Missile Defense (EW/ASMD) experiments
- Completed the final spiral in the multi-year series of Littoral Active Multistatic Program (LAMP) experiments
- Completed the final spiral of the multi-year series of Sub-Surface Guided Missile Nuclear/Special Operations Forces (SSGN/SOF) CONOPS & Full Range Connectivity experiments
- Completed the Counter Maritime Improvised Explosive Device Experiment
- Completed Terminal Fury 08 Exercise and Experiment
- Completed Austere Challenge 08 Exercise and Experiment

FY 2009 Plans:

- Continue all FY 2008 efforts less those noted as completed above.
- Continue participation in JFCOM experimentation continuum
- Continue Limited Objective Experiments

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PROJECT NUMBER: 2357 PROJECT TITLE: MARITIME BATTLE CENTER

- Continue CONOPS Development Experiments
- Initiate and execute Sea Trial Experiments, War Games, and Seminars
- Initiate and complete the Sonar/Radar Data Comparison experiment
- Initiate and complete Submarine Automated Identification System Buoy experiment
- Initiate and complete the Maritime Domain Awareness Analyst Tools experiment
- Initiate and complete the Millimeter Wave Chaff experiment
- Initiate and complete the Surface Action Group Modeling experiment
- Initiate and complete the Harpoon Seeker Modeling in an Electronic Attack environment experiment
- Initiate and complete the Surface Meteorological and Oceanographic experiment
- Initiate and complete the Global Ocean Forecasting experiment
- Initiate and complete the Fast Attack Craft/Fast Inshore Attack Craft experiment
- Initiate and complete the Submarine Launched Unmanned Aerial System Experiment
- Initiate and complete the first of the multi-year series of Littoral Force Protection experiments
- Initiate and complete the final spiral of the multi-year series of Tactical Tomahawk 3rd Party Targeting experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Maritime Headquarters with Maritime Operations Center experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Intelligence, Surveillance and Reconnaissance (ISR) Support to the Maritime Headquarters with Maritime Operations Center experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Networking of Military Operations Center experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Network Operations, Information Operations and Space Support experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Information Assurance/Computer Network Defense experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Electronic Warfare Improvement experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Maritime Domain Awareness experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Coalition Networks experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Unclassified Common Operational Picture (COP) experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Bandwidth Optimization experiments

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- Initiate and complete the FY-09 spiral of the multi-year series of Surface Ship Periscope Detection experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Submarine Unmanned Aerial System experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Submarine Communications at Speed and Depth experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Network Instrumentation and Visualization experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Offensive Information Operations experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Cross Domain Solution experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Command and Control/Real-Time Collaboration experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Persistent Day/Night Tracking experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Mine Countermeasures in Support of Homeland Defense experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Littoral Combat Ship Mine Warfare Mission Modules experiments
- Initiate and complete the FY-09 spiral of the multi-year series of Naval Obscurant experiments

FY 2010 Plans:

FY 2010 plans will be prioritized and approved by the end of Feb 2009; items listed below represent some of the experiments being considered.

- Continue all FY 2009 efforts less those noted as completed above.
- Continue participation in JFCOM experimentation continuum
- Continue Limited Objective Experiments
- Continue CONOPS Development Experiments
- Initiate and execute Sea Trial Experiments, War Games, and Seminars

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C. OTHER PROGRAM FUNDING SUMMARY - NAVY RELATED RDT&E:
Not applicable.

OTHER PROGRAM FUNDING SUMMARY - NON-NAVY RELATED RDT&E:
Not applicable

D. ACQUISITION STRATEGY:
Not applicable.

FY 2010 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: May 2009
Exhibit R-3

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 2357 PROJECT TITLE: MARITIME BATTLE CENTER

Exhibit R-3 Cost Analysis														Date: MAY 2009
APPROPRIATION/BUDGET ACTIVITY: RDT&E, N/BA 4			PROGRAM ELEMENT 0604707N											PROJECT NAME and NUMBER: Maritime Battle Center 2357
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost			FY-09 Cost	FY-09 Award Date	FY-10 Cost	FY-10 Award Date			Cost To Comp.	Total Cost	Target Value of Contract
System Test and Evaluation	Various	Various	196.747			26.245	Various	26.097	Various			CONT	CONT	CONT
Subtotal T&E			196.747			26.245		26.097				CONT	CONT	CONT
Program Management	Various	Various	41.126			4.567	Various	4.435	Various			CONT	CONT	CONT
Subtotal Management			41.126			4.567		4.435				CONT	CONT	CONT
Total Cost			237.873			30.812		30.532				CONT	CONT	CONT

BUDGET ACTIVITY: 04
PROGRAM ELEMENT: 0604707N PROGRAM ELEMENT TITLE: SPACE & ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT
PROJECT NUMBER: 9999 PROJECT TITLE: CONGRESSIONAL PLUS-UPS

CONGRESSIONAL PLUS-UPS:

	FY 2008	FY 2009
CROSS-DOMAIN NETWORK ACCESS SYSTEM	0.000	0.798