Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	112.516	123.331	94.972	-	94.972	61.382	24.740	24.999	24.871	Continuing	Continuing
2341: *METOC Data Acquisition*	20.859	15.288	6.083	-	6.083	6.802	6.807	6.981	6.940	Continuing	Continuing
2342: *METOC Data Assimilation and Mod*	18.685	15.311	10.636	-	10.636	11.321	10.026	10.022	9.995	Continuing	Continuing
2343: *Tactical METOC Applications*	15.624	13.736	9.562	-	9.562	8.271	-	-	-	0.000	47.193
2344: *Precise Timing and Astronomy*	2.216	2.118	1.025	-	1.025	1.043	1.014	1.023	0.982	Continuing	Continuing
3207: *Fleet Synthetic Training*	0.973	3.437	0.968	-	0.968	1.041	1.065	1.086	1.105	Continuing	Continuing
3229: *JMAPS*	52.765	73.441	66.698	-	66.698	32.904	5.828	5.887	5.849	Continuing	Continuing
9999: *Congressional Adds*	1.394	-	-	-	-	-	-	-	-	0.000	1.394

A. Mission Description and Budget Item Justification

The Air Ocean Tactical Applications (AOTA) Program Element is fully aligned with the Navy's maritime strategy 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 programs of record and Tactical Decision Aids 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 and predicting 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. Model data, products and services can be used by forward-deployed personnel or in a reach-back mode to optimize sensor placement and force allocation decisions. Global Geospatial Information and Services efforts within this program address the bathymetric 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 and specific unit-level combat systems. Finally, this program develops technological upgrades for the U.S. Naval Observatory's Master Clock system to meet requirements with the demands of Department of Defense 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*

Major emphasis areas include the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) and the J-MAPS programs of record, and the Meteorological and Oceanographic (METOC) Future Mission Capabilities, the METOC Space-Based Sensing Capabilities, the Precise Timing and Astrometry, the Fleet Synthetic Training and the Tactical Oceanographic Capabilities / Under Sea Warfare projects.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	118.495	123.331	113.306	-	113.306
Current President's Budget	112.516	123.331	94.972	-	94.972
Total Adjustments	-5.979	-	-18.334	-	-18.334
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-2.514	-			
• SBIR/STTR Transfer	-2.914	-			
• Program Adjustments	-	-	-17.977	-	-17.977
• Section 219 Reprogramming	-0.542	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.357	-	-0.357
• Congressional General Reductions Adjustments	-0.009	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 9999: *Congressional Adds*		
Congressional Add: *Semi-Submersible UUV*	1.394	-
Congressional Add Subtotals for Project: 9999	1.394	-
Congressional Add Totals for all Projects	1.394	-

Change Summary Explanation

Technical: Beginning in FY12 the Navy has canceled all Ocean Bottom Characterization Initiative (OBCI) activities previously planned as part of the Tactical Oceanographic Capabilities / Under Sea Warfare (TOC/USW) project.
Beginning in FY14 the Navy has canceled all Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program development efforts.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*

Schedule: The schedule for the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program of record has been updated, post contract award, to reflect that the Navy has canceled all of the programs development efforts after FY13.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
2341: *METOC Data Acquisition*	20.859	15.288	6.083	-	6.083	6.802	6.807	6.981	6.940	Continuing	Continuing
Quantity of RDT&E Articles	4	2	0	0	0	0	0	0	0		

Note

Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV) FY 2012 efforts continued in PE 0604218N (Air/Ocean Equipment Engineering) project 2345 (Fleet METOC Equipment).

Quantity of RDT&E Articles for FY 2010 represent LBS-G Engineering Design Models (EDMs) and for FY 2011 represent LBS-AUV EDMs.

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) identified as the most promising candidates are transitioned from the government's and commercial industry's technology base. These new sensor technologies are demonstrated, validated and integrated into operational programs for warfighters. These new sensor capabilities provide timely and accurate METOC data and products to operational and tactical commanders. METOC data requirements have likewise evolved as the emphasis on naval warfare has evolved from blue water operations to the littoral and deep strike battlespace. The littoral and deep strike regions are dynamic and complex, characterized by strong and variable oceanographic and atmospheric conditions. The need to accurately characterize these conditions is more crucial than ever in planning and executing warfare operations and effectively allocating force weapon and sensor systems. 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. Operational sensors are deployed great distances from the target area of interest. The challenge is to collect and disseminate METOC data in variable and dynamic littoral environmental conditions or in denied, remote or inaccessible areas over extended periods of time. This project: 1) provides the means to rapidly and automatically acquire a broad array of METOC data using both off-board and on-board sensors; 2) provides an on-scene assessment capability for the tactical commander; 3) provides the tactical commander with real-time METOC data and products for operational use; 4) demonstrates and validates the use of tactical workstations and desktop computers for processing and display of METOC data and products; 5) demonstrates and validates techniques which employ data compression, connectivity and interface technologies to obtain, store, process, distribute and display these METOC data and products; 6) develops new charting and bathymetric survey techniques necessary to reduce the existing shortfall in coastal hydrographic survey requirements; 7) develops an expanded database for predictive METOC models in areas of interest; and 8) supports the development of radar weather using through-the-sensor techniques.

Major emphasis areas include the Meteorological and Oceanographic Future Mission Capabilities (METOC FMC) and the Tactical Oceanographic Capabilities / Under Sea Warfare (TOC/USW) projects.

FY 2012 request provides for continued advanced software and hardware component and prototype efforts associated with acquiring environmental data, and METOC data transport, storage, delivery, design and development efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV)	8.003	2.465	-	-	-
Articles:	4	2			
FY 2010 Accomplishments: Completed the System Development and Demonstration (SDD) (or Engineering and Manufacturing Development (EMD)) phase of the LBS-Glider (LBS-G) system (LBS-G Milestone C scheduled in Q4FY10). Received delivery of four LBS-G Engineering Design Models (EDMs) and completed at-sea and ashore Developmental Testing and Evaluation (DT&E) of the complete end-to-end system including command and control, mission planning, launch and recovery, mission profile characteristics and other Key Performance Parameters and Key System Parameters. Completed the development of the LBS-Glider (LBS-G) Engineering Change Proposal (ECP) definition and associated engineering studies. Began the System Development and Demonstration (SDD) (or Engineering and Manufacturing Development (EMD)) phase of the LBS-Autonomous Undersea Vehicle (LBS-AUV). Funding increase reflected the beginning of the SDD phase of the LBS-AUV portion of the Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV) program.					
FY 2011 Plans: Update LBS-G engineering studies, and cost estimates for the LBS-G ECPs as required. Continue the LBS-AUV EMD (formerly SDD) phase (LBS-AUV Milestone C (MS-C) is scheduled for Q3/Q4 FY12). Develop the LBS-AUV Capability Production Document (CPD) and other required MS-C documentation. Conduct the LBS-AUV Critical Design Review (CDR). Develop two LBS-AUV EDMs and begin associated technical and engineering reviews. FY 2012 efforts continued in PE 0604218N (Air/Ocean Equipment Engineering) project 2345 (Fleet METOC Equipment).					
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	7.927	7.369	5.771	-	5.771
Articles:	0	0	0		0
FY 2010 Accomplishments: Continued advanced component and prototype efforts associated with acquiring environmental data. Continued development of advanced data measurement and survey techniques to improve survey planning and execution. Continued development of improved data quality control technologies and the automation of data acquisition processes. Continued 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. Implemented Through-The-Sensor (TTS) technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, Command, Control, Communications, Computers and Intelligence (C4I) distribution, and tactical decision systems. Developed					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Tactical Environmental Processor (TEP) requirements, specifications, standards and system engineering plans for integration of the TEP algorithms into the Aegis SPY-1 Open Architecture upgrade program. ***FY 2011 Plans:*** 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 GI&S capabilities within Navy METOC production centers and throughout the fleet user base. Continued to implement TTS technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, distribution, and tactical decision systems. Develop advanced data acquisition and data processing techniques for oceanographic and atmospheric data. ***FY 2012 Base Plans:*** Continue advanced component and prototype efforts associated with acquiring environmental data. Continue to develop advanced data measurement and survey techniques that capture measurement uncertainties in order to provide warfare commanders with an accurate assessment of uncertainty in sensor performance prediction products and services. 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. Continue to develop and implement TTS technologies to use tactical detection systems to characterize undersea and atmospheric environment in the battlespace integrate with analysis, distribution, and tactical decision systems. Develop advanced data acquisition, data processing and analysis techniques for GI&S, oceanographic and atmospheric data and information. Develop METOC data and product delivery technologies.					
Title: Naval Integrated Tactical Environmental System Next Generation (NITES-Next) ***Articles:*** ***FY 2010 Accomplishments:*** Continued support for METOC data transport, storage, delivery, design and development efforts in preparation for Milestone C NITES-Next activities.	0.094 0	-	-	-	-
Title: Tactical Oceanography Capabilities / Undersea Warfare (USW) ***Articles:***	4.835 0	5.454 0	0.312 0	-	0.312 0

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
FY 2010 Accomplishments: Continued to develop, test and demonstrate advanced mission planning tools and Geographic Information Systems (GIS) in support of world-wide Undersea Warfare (USW) operations. Continued to develop capability to calculate transmission loss (TL) values in tactical timeframes to include uncertainty quantification of those values. Developed and validated both acoustic and non-acoustic USW product effectiveness algorithms to aid in environmental analysis of Naval exercises. Developed methods for a theater-wide ambient noise planning and forecasting capability. Ocean Bottom Characterization Initiative (OBCI): Developed and demonstrated advanced in-situ sensor systems to support littoral environmental awareness in support of USW missions. Used operational Navy platforms for in-situ oceanographic and acoustic measurements. Developed Next Generation bottom loss and backscatter databases and database structures. Developed improved techniques to support geoacoustic and oceanographic survey operations. Developed algorithms for inclusion of bioacoustic effects in acoustic surveys. ***FY 2011 Plans:*** Develop current advanced data collection systems to generate products and populate databases that characterize the acoustic environment in support of USW missions. Develop autonomous underwater vehicle/ system (AUV) technology demonstrations to measure in-situ oceanographic, acoustic and geoacoustic parameters remotely from Fleet survey vessels. Continue to develop capabilities to calculate acoustic TL values in tactical timeframes to include uncertainty quantification of those values. Continue to develop next generation acoustic bottom loss and backscatter databases and database structures for transition into U.S. Navy USW tactical decision aids (TDAs). Conduct Validation and Verification (V&V) of next generation acoustic models, databases and algorithms. Continue to develop improved techniques to support geoacoustic and oceanographic survey operations. Continue to develop algorithms for inclusion of bioacoustic effects in acoustic surveys and Navy USW operations. Develop active acoustic sources to aid geoacoustic survey operations. Provide project technical and program management oversight. ***FY 2012 Base Plans:*** Develop geoacoustic sea bed characterization techniques, sensors and equipment to prepare the Battlespace for USW operations. Transition models, algorithms and databases that either calculate accurate acoustic TL or characterize environmental parameters that affect TL and develop TL calculation implementations. Develop tools that aid in oceanographic, acoustic and other environmental data visualization afloat and at reach back cells. Expand Validation and Verification (V&V) efforts to include the full spectrum of Naval Oceanography enterprise					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
(NOe) USW/acoustic support products. Develop predictive products that assess performance of non-acoustic USW sensors (radars, optical and infra-red sensors). The Navy has canceled all previously funded Ocean Bottom Characterization Initiative (OBCI) activities.					
Accomplishments/Planned Programs Subtotals	20.859	15.288	6.083	-	6.083

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	14.513	25.581	22.003	10.800	32.803	18.450	20.417	21.305	21.559	Continuing	Continuing
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	5.297	4.138	4.436	0.000	4.436	2.669	2.787	2.916	2.878	Continuing	Continuing
• RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD*	18.685	15.311	10.636	0.000	10.636	11.321	10.026	10.022	9.995	Continuing	Continuing
• RDTEN/0603207N/2343: *TACTICAL METOC APPLICATIONS*	15.624	13.736	9.562	0.000	9.562	8.271	0.000	0.000	0.000	Continuing	Continuing

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support the meteorological and oceanographic (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 Navy.

E. Performance Metrics

Goal: Develop techniques and tools to acquire METOC data in order to improve the accuracy of global and regional scale meteorological and oceanographic forecast models. Advanced sensor component, data collection, and meteorological, oceanographic and hydrographic survey technique development tasks are directed by Resource Sponsor, with input from external Systems Commands and/or Type Commanders, in response to validated capability gaps or operational fleet requirements. Wherever applicable, and based on favorable Science & Technology (S&T) assessments, tasks shall leverage or transition existing Small Business Innovative Research and/or RDT&E Budget Activity 6.2 - 6.3 S&T work.
Metric -- Tasks will address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	Naval Research Laboartory:Washington, DC	53.982	6.519	Oct 2010	4.949	Oct 2011	-		4.949	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSC PAC:California	21.883	0.150	Oct 2010	0.150	Oct 2011	-		0.150	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various:Various	43.021	-		-		-		-	Continuing	Continuing	Continuing
LBS-G	C/CPIF	Teledyne Brown Eng:Alabama	6.557	-		-		-		-	0.000	6.557	
METOC Future Mission Capabilities	WR	NPGS:Monterey, CA	-	0.200	Oct 2010	0.200	Oct 2011	-		0.200	0.000	0.400	
METOC Future Mission Capabilities	WR	Penn State University:PA	-	0.300	Dec 2010	0.300	Dec 2011	-		0.300	0.000	0.600	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	NRL:Washington, DC	-	1.400	Oct 2010	0.284	Oct 2011	-		0.284	0.000	1.684	
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	Hydroid INC:Pocasset, MA	-	1.865	Nov 2010	-		-		-	0.000	1.865	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	C/FP	Univ. of Texas:Texas	-	1.300	Dec 2010	-		-		-	0.000	1.300	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	SSC PAC:California	-	2.754	Oct 2010	-		-		-	0.000	2.754	
		Subtotal	125.443	14.488		5.883		-		5.883			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	Various:Various	2.672	-		-		-		-	Continuing	Continuing	Continuing
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC:Virgina	-	0.600	Nov 2010	-		-		-	0.000	0.600	
		Subtotal	2.672	0.600		-		-		-			

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	OPTEVFOR:Virginia	0.160	-		-		-		-	0.000	0.160	
METOC Future Mission Capabilities	MIPR	JITC:Arizona	0.040	-		-		-		-	0.000	0.040	
		Subtotal	0.200	-		-		-		-	0.000	0.200	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified:Not Specified	0.096	-		-		-		-	0.000	0.096	
METOC Future Mission Capabilities Management Support	C/FP	BAH:Virgina	-	0.200	Nov 2010	0.200	Nov 2011	-		0.200	0.000	0.400	
		Subtotal	0.096	0.200		0.200		-		0.200	0.000	0.496	

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	128.411	15.288		6.083		-		6.083			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*	

	Total Prior Years Cost	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2341: *METOC Data Acquisition*	

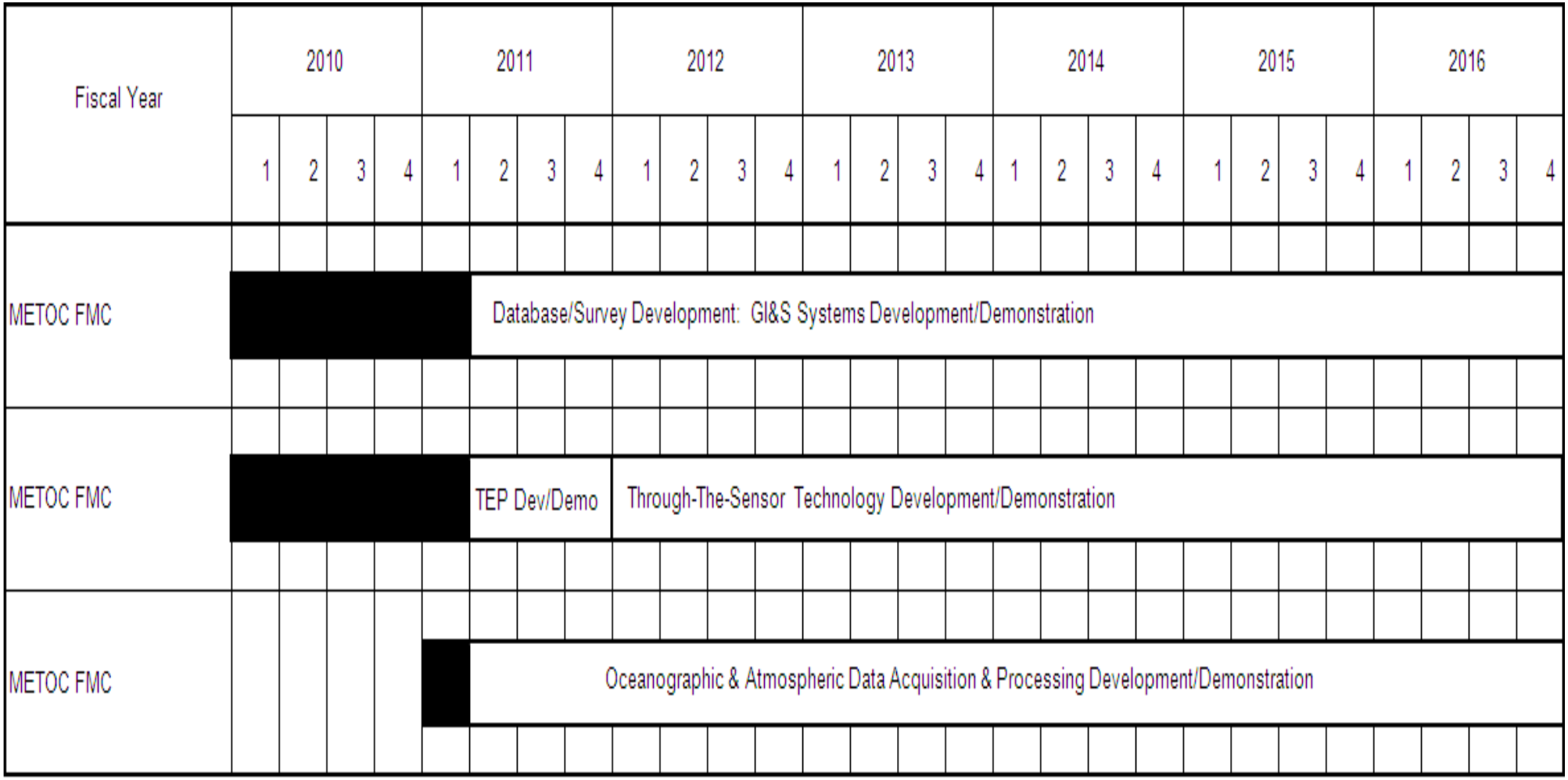

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

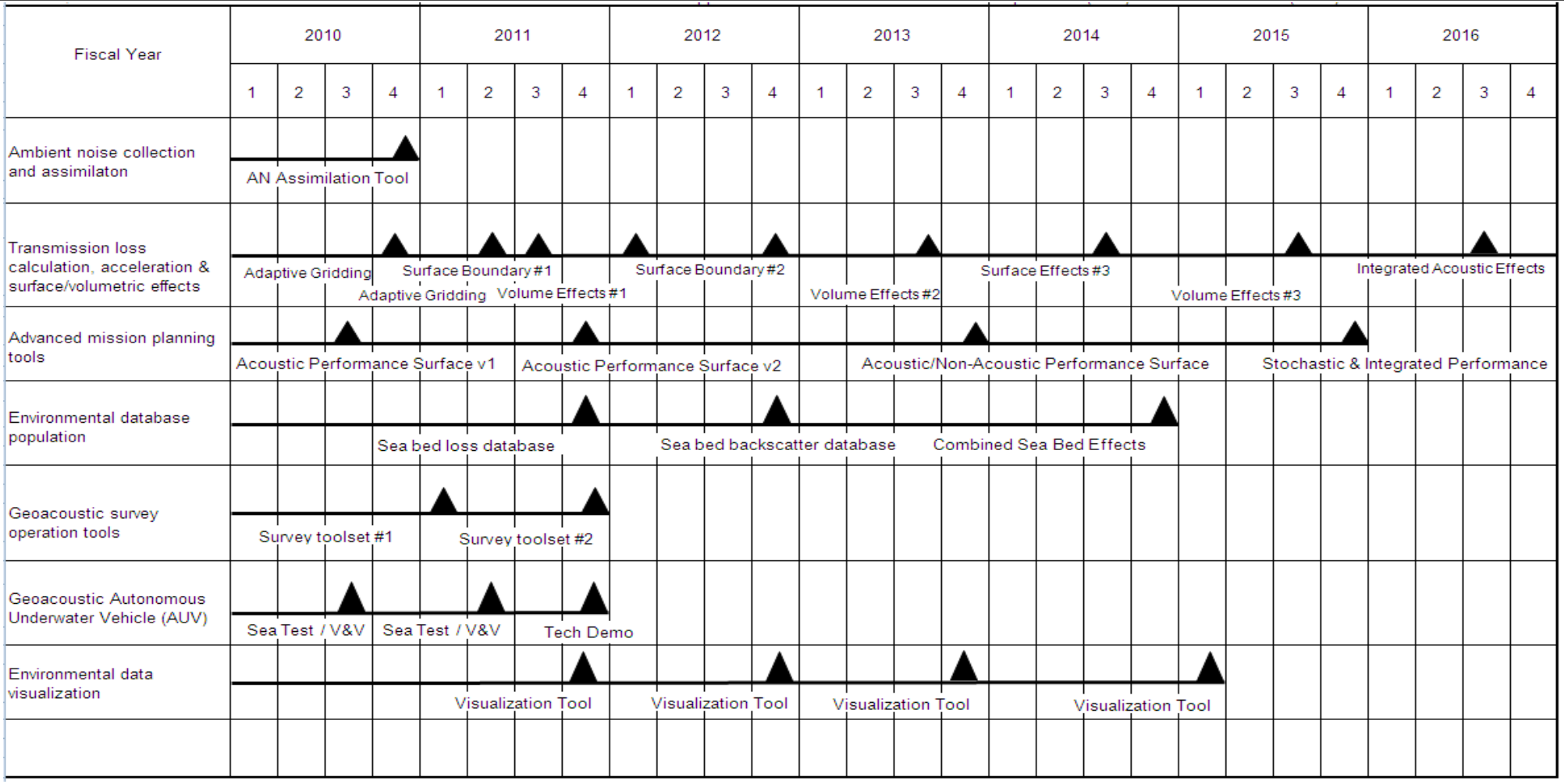

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

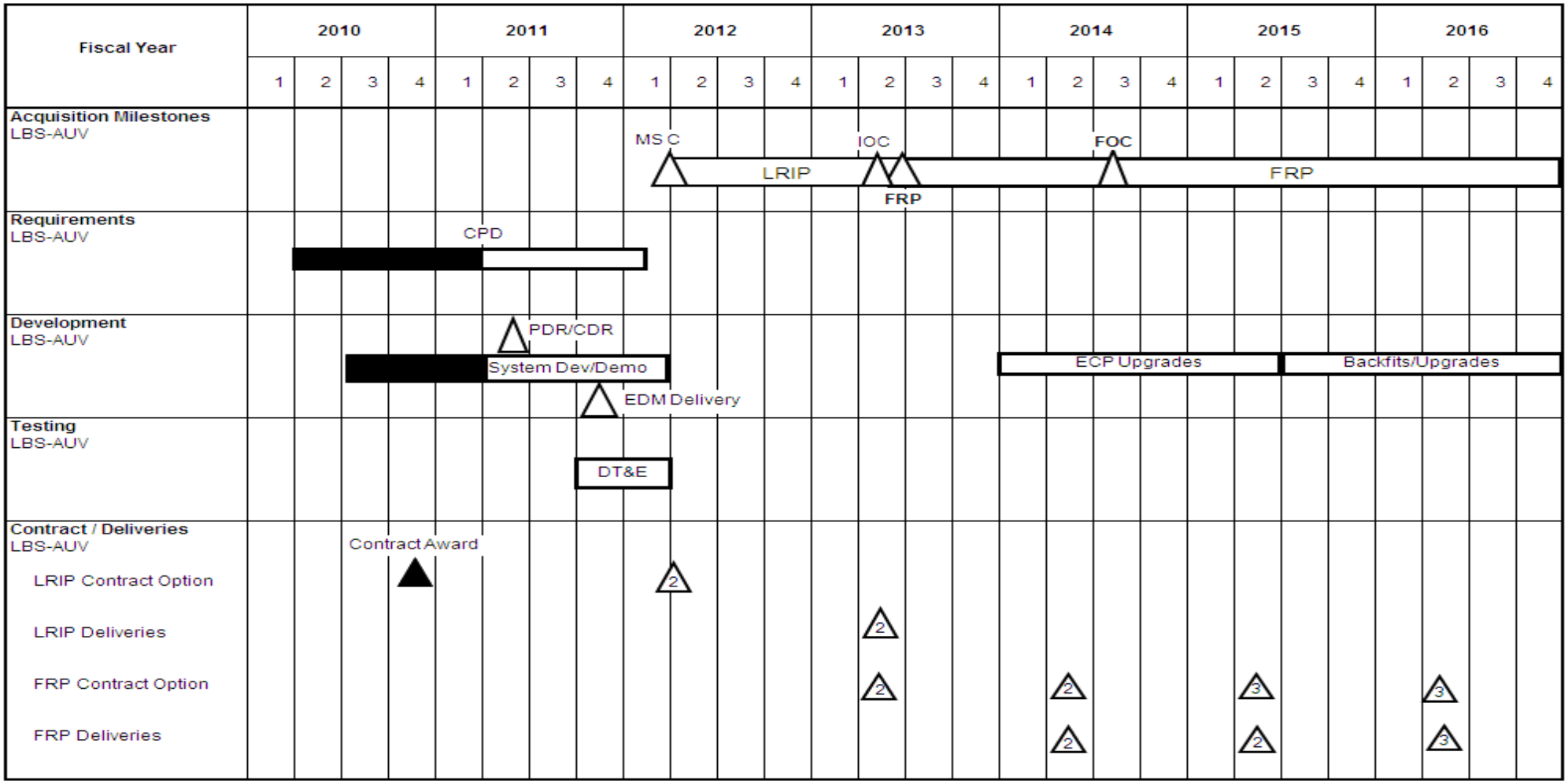

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

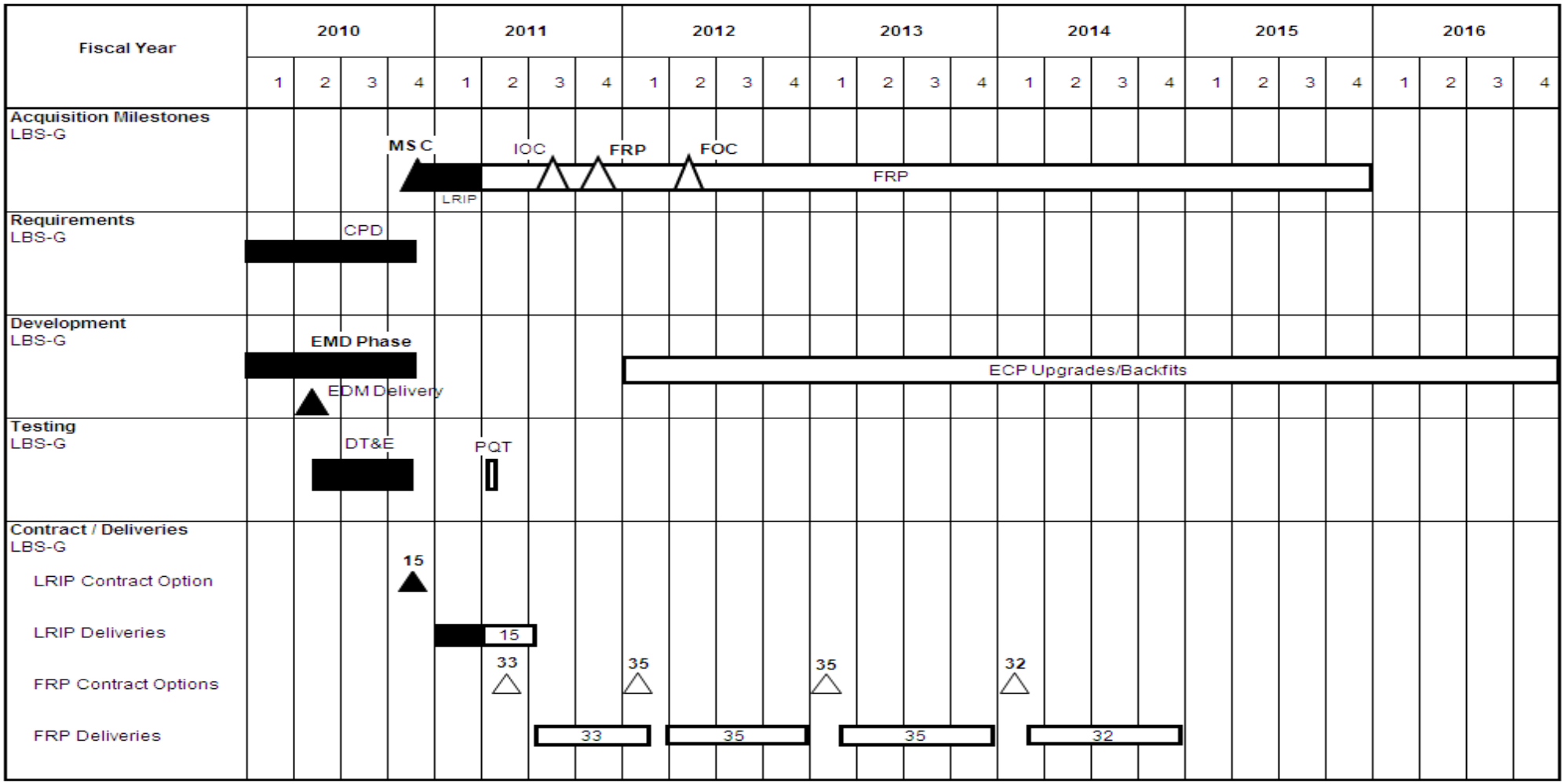

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2341				
Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC) Geospacial Information and Services (GI&S) System Development / Demonstration	1	2010	4	2016
METOC FMC Tactical Environmental Processor (TEP) Development / Demonstration	1	2010	4	2011
METOC FMC Ocean-Atmos Acquisition & Processing Development / Demonstration	1	2011	4	2016
METOC FMC Through-the-Sensor (TTS) Development / Demonstration	1	2012	4	2016
Tactical Oceanography Capabilities (TOC) / Undersea Warfare (USW) Acoustic Performance Surface v1	3	2010	3	2010
TOC USW Sea Test / V&V 1	3	2010	3	2010
TOC USW AN Assimilation Tool	4	2010	4	2010
TOC USW Adaptive Gridding 1	4	2010	4	2010
TOC USW Survey toolset #1	1	2011	1	2011
TOC USW Adaptive Gridding 2	2	2011	2	2011
TOC USW Sea Test / V&V 2	2	2011	2	2011
TOC USW Surface Boundary #1	3	2011	3	2011
TOC USW Acoustic Performance Surface v2	4	2011	4	2011
TOC USW Sea bed loss database	4	2011	4	2011
TOC USW Survey toolset #2	4	2011	4	2011
TOC USW Tech Demo	4	2011	4	2011
TOC USW Visualization Tool toolset #1	4	2011	4	2011
TOC USW Volume Effects #1	1	2012	1	2012
TOC USW Surface Boundary #2	4	2012	4	2012
TOC USW Sea bed backscatter database	4	2012	4	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TOC USW Visualization Tool toolset #2	4	2012	4	2012
TOC USW Volume Effects #2	3	2013	3	2013
TOC USW Acoustic/Non-Acoustic Performance Surface	4	2013	4	2013
TOC USW Visualization Tool toolset #3	4	2013	4	2013
TOC USW Surface Effects #3	3	2014	3	2014
TOC USW Combined Sea Bed Effects DB	4	2014	4	2014
TOC USW Visualization Tool toolset #4	1	2015	1	2015
TOC USW Volume Effects #3	3	2015	3	2015
TOC USW Stochastic & Integrated Performance Surface	4	2015	4	2015
TOC USW Integrated Acoustic Effects	3	2016	3	2016
Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV) - Autonomous Undersea Vehicles (LBS-AUV) Capabilities Production Document	2	2010	1	2012
LBS-AUV System Development & Demonstration	3	2010	1	2012
LBS-AUV Contract Award	4	2010	4	2010
LBS-AUV Preliminary Design Review (PDR)	2	2011	2	2011
LBS-AUV Critical Design Review (CDR)	2	2011	2	2011
LBS-AUV Enterprise Data Model (EDM) Delivery	4	2011	4	2011
LBS-AUV Development, Test, & Evaluation (DT&E)	4	2011	1	2012
LBS-AUV Milestone C (MS C)	1	2012	2	2012
LBS-AUV Low Rate Initial Production (LRIP) Contract Option: 2	1	2012	2	2012
LBS-AUV Initial Operational Capability (IOC)	2	2013	2	2013
LBS-AUV LRIP Deliveries: 2	2	2013	2	2013
LBS-AUV Full Rate Production (FRP)	2	2013	4	2016
LBS-AUV Full Rate Production (FRP) Contract Option: 2	2	2013	2	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LBS-AUV Engineering Change Proposals (ECPs) Upgrades	1	2014	2	2015
LBS-AUV FRP Contract Option: 2	2	2014	2	2014
LBS-AUV 1st FRP Deliveries: 2	2	2014	2	2014
LBS-AUV Full Operational Capability (FOC)	3	2014	3	2014
LBS-AUV FRP Contract Option: 3	2	2015	2	2015
LBS-AUV 2nd FRP Deliveries: 2	2	2015	2	2015
LBS-AUV Backfits / Upgrades	3	2015	4	2016
LBS-AUV LBS-AUV FRP Contract Option: 3	2	2016	2	2016
LBS-AUV LBS-AUV 3rd FRP Deliveries: 3	2	2016	2	2016
Littoral Battlespace Sensing, Unmanned Undersea Vehicles (LBS-UUV) - Gliders (LBS-G) CPD	1	2010	4	2010
LBS-G EMD Phase	1	2010	4	2010
LBS-G EDM Delivery	2	2010	2	2010
LBS-G DT&E	2	2010	4	2010
LBS-G MS C	4	2010	4	2010
LBS-G LRIP Contract Option: 15	4	2010	4	2010
LBS-G LRIP Deliveries: 15	1	2011	3	2011
LBS-G Production Qualification Testing (PQT)	2	2011	2	2011
LBS-G 1st FRP Contract Option: 33	2	2011	2	2011
LBS-G IOC	3	2011	3	2011
LBS-G 1st FRP Deliveries: 33	3	2011	1	2012
LBS-G FRP	4	2011	4	2011
LBS-G 2nd FRP Contract Option: 35	1	2012	1	2012
LBS-G ECP Upgrades / Backfits	1	2012	4	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
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	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LBS-G FOC	2	2012	2	2012
LBS-G 2nd FRP Deliveries: 35	2	2012	4	2012
LBS-G 3rd FRP Contract Option: 35	1	2013	1	2013
LBS-G 3rd FRP Deliveries: 35	1	2013	4	2013
LBS-G 4th FRP Contract Option: 32	1	2014	1	2014
LBS-G 4th FRP Deliveries: 32	1	2014	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
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COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
2342: *METOC Data Assimilation and Mod*	18.685	15.311	10.636	-	10.636	11.321	10.026	10.022	9.995	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV) FY 2012 efforts continued in PE 0604218N (Air/Ocean Equipment Engineering) project 2345 (Fleet METOC Equipment).

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) future METOC and environmental satellite data readiness and risk reduction preparations to develop hardware and software that will allow ground stations to receive, ingest and exploit satellite data including the National Polar Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) Polar Systems' Meteorological Operational satellites A & B (METOP-A & B), Joint Polar Satellite System (JPSS), and Defense Meteorological Satellite Program (DMSP). These techniques allow for the integration and tactical application of significant oceanographic and atmospheric data derived from satellite-borne sensors. Satellite and unmanned sensor data, combined with manned platform data are foundational to a robust numerical weather and oceanographic modeling capability that predicts battlespace conditions impacting fleet and adversary weapon and sensor performance. 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 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 Sensor R&D to meet Chief of Naval

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
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Operations and Commander, Fleet Forces Command requirements for remote autonomous, clandestine, littoral battlespace sensing in near shore areas in support of Sea Shield & Sea Basing.

Major emphasis areas include the Meteorological and Oceanographic Future Mission Capabilities (METOC) the Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities, and the Tactical Oceanographic Capabilities / Under Sea Warfare projects.

FY 2012 request provides for continued 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), the continued development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies, continued development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes, and the development of data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Littoral Battlespace Sensing, Unmanned Undersea Vehicle (LBS-UUV)	1.800	0.473	-	-	-
Articles:	0	0			
FY 2010 Accomplishments: Demonstrated a basic capability to assimilate, database, and relay data and derived products from ocean gliders, including optics (glider analysis, satellite coupling, Navy Coastal Ocean Model integration, etc.), temperature, depth, salinity, and currents. Demonstrated prototype mission planning and adaptive sampling capability as part of the Littoral Battlespace Sensing - Gliders (LBS-G) System Development and Demonstration (SDD) (or Engineering and Manufacturing Development (EMD)) phase. Development of advanced bathymetric data assimilation techniques such as Inertial Navigation Drift, automated fusion, micronavigation, and feature based navigation. Continued to define the LBS-UUV Engineering Change Proposal (ECP) Fusion requirements and capabilities. Integrated advanced quality control algorithms into the LBS-G system as required as part of the SDD (EMD) phase of the procurement. Completed at-sea and ashore Development Testing and Evaluation of the complete end-to-end glider system including command and control, mission planning, mission profile characteristics and other Key Performance Parameters and Key System Parameters. Began the SDD (EMD) phase of the Littoral Battlespace Sensing - Autonomous Undersea Vehicle (LBS-AUV).					
FY 2011 Plans: Develop advanced LBS-G and LBS-AUV data fusion efforts. Demonstrate prototype mission planning and adaptive sampling capability at the Naval Oceanographic Office (NAVOCEANO). Begin integration of advanced					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
quality control algorithms as required into the LBS-AUV program as part of its SDD (EMD) phase. Continue the LBS-AUV SDD (EMD) Phase.					
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	8.541	6.250	4.758	-	4.758
Articles:	0	0	0		0
FY 2010 Accomplishments: Continued 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. Continued development of advanced oceanographic and atmospheric prediction systems and architectures to provide improved forecasts and estimates of product accuracies. Continued development of improved data fusion techniques, data quality control technologies and accelerate the automation prediction processes. Developed data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Developed atmospheric fusion algorithms and demonstrate Tactical Environmental Processor (TEP) reachback fusion capability. Developed network integration capability and continued to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Developed 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.					
FY 2011 Plans: 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 of and visualization of prediction processes leading to improved weapon and sensor allocation decisions. Continue to develop data assimilation and fusion techniques and technologies for tactical radars, remote sensing and undersea sensor systems. Continue to develop atmospheric fusion algorithms and demonstrate TEP reachback fusion capability. Continue development of network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products. Continue development of advanced data assimilation and data quality control algorithms for glider and AUVs data					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
including, temperature, depth, salinity, optics, hydrographic, bathymetric and other water column and ocean bottom properties. ***FY 2012 Base Plans:*** 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 of prediction processes. Continue to develop data assimilation and fusion techniques and technologies for tactical sensors, remote sensing and undersea sensor systems. Continue to develop atmospheric fusion algorithms and demonstrate reach-back fusion capability. Continue to develop network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products.					
Title: Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities	4.903	5.008	2.787	-	2.787
Articles:	0	0	0		0
FY 2010 Accomplishments: Continued development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Developed Naval applications using this data for Naval METOC Production Centers. Funding increase reflects the need for additional data assimilation algorithms and applications resulting from the anticipated launch of the National Polar Orbiting Operational Environmental Satellite System Preparatory Project (NPP) satellite in FY11. ***FY 2011 Plans:*** Begin development of the satellite data assimilation algorithms using NPP data. Continue development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Continue research and development of data assimilation processes and advanced modeling techniques for ingesting satellite sensor data. ***FY 2012 Base Plans:*** Begin development of the data processing and data assimilation algorithms using National Polar Orbiting Operational Environmental Satellite System Preparatory Project (NPP), Meteorological Operational satellite program (MetOp), and Defense Meteorological Satellite Program (DMSP) satellite data. Continue development					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Conduct research and development of data processing techniques, data assimilation processes and advanced modeling methodologies utilizing satellite sensor data to generate METOC products. Prepare to utilize data from follow-on DoD Satellites to develop METOC products.					
Title: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	3.441	3.580	3.091	-	3.091
Articles:	0	0	0		0
FY 2010 Accomplishments: Continued 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. Continued to refine and validate USW-related performance assessment and decision products for use at the Naval Oceanographic Office (NAVOCEANO) Anti-Submarine Warfare (ASW) Reachback Cell (RBC) and in USW decision tools. Continued spiral development of active and passive acoustic propagation loss models for use in fleet mission planning systems supporting mono- and multistatic Antisubmarine Warfare operations. Continued technology upgrades to transmission loss acceleration algorithms. Developed algorithms that characterize acoustic reverberation as well as boundary and volume loss/scatter functions as observed by active and passive tactical sonar systems. Developed decision tool algorithms that optimize operational sonar system performance. Continued to develop directional and omnidirectional regional ambient noise characterization tools. Conducted technical demonstration of in-situ ocean parameter collection systems. Populated/upgraded oceanographic and acoustic databases in Combatant Commanders (COCOM) areas of interest. Transitioned algorithms that capture and communicate variability and uncertainty, robustness and sensitivity as input to Fleet USW decision tools and underlying models and data bases. Developed oceanographic operations analysis tools. Developed real-time and post-event ASW performance assessment tools.					
FY 2011 Plans: Continue to develop decision tool asset allocation and mission planning modules to optimize deployment of both environmental data collection assets and tactical USW acoustic and non-acoustic sensors. Continue to refine and validate USW-related performance assessment and decision products for use at the NAVOCEANO ASW RBC and in USW decision tools. Develop algorithms for quantification of volume scattering effects on active sonar. Continue spiral development of active and passive acoustic propagation loss models for use in fleet mission planning systems supporting mono- and multistatic USW operations. Continue technology upgrades to transmission loss acceleration algorithms. Continue to develop algorithms that characterize acoustic volume loss/scatter functions as observed by active tactical sonar systems. Develop sea surface and					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
seabed boundary interaction characterizations to support sensor performance predictions. Expand capabilities and increase access speed of acoustic surface scattering and loss modules. Continue to develop directional and omnidirectional regional ambient noise characterization and forecasting tools. Continue to populate/upgrade oceanographic and acoustic databases in Combatant Commanders (COCOM) areas of interest. Continue to transition algorithms that capture and communicate variability and uncertainty, robustness and sensitivity as input to Fleet ASW decision tools and underlying models and data bases. Develop an ASW RBC ocean model assessment toolkit. Develop post-USW event Reconstruction and Analysis (R&A) validation tools and capabilities. Develop ASW Reachback Cell (RBC) visual analysis toolset. Begin capability upgrades and validation of Next Generation electro-magnetic and electro-optic performance prediction systems and decision tools. ***FY 2012 Base Plans:*** Continue visualization and decision tool development that assist USW warfighters to optimally deploy assets equipped with both acoustic and non-acoustic sensors and to take advantage of prevailing environmental conditions. Continue to refine and validate USW-related performance surface and decision products for use afloat and at reachback cells to determine appropriate tactical Courses of Action (COAs). Build a second generation USW R&A capability to support the Naval Oceanographic enterprise (NOe.) Build an overarching ambient noise characterization architecture that expediently and accurately relays effects of natural and man-made noise on Naval acoustic sensors conducting USW operations. Continue population/upgrade of oceanographic and acoustic databases in USW areas of interest. Transition algorithms that capture and communicate variability and uncertainty contained in the output of underlying model and data base components of ASW TDAs. Expand capabilities and increase access speed of acoustic surface scattering and loss modules. Populate/upgrade oceanographic and acoustic databases in COCOM areas of interest. Develop post-USW event Reconstruction and Analysis (R&A) validation tools and capabilities. Continue capability upgrades and validation of Next Generation electro-magnetic and electro-optic performance prediction systems and decision tools. Continue development of an ASW RBC ocean model assessment toolkit.					
Accomplishments/Planned Programs Subtotals	18.685	15.311	10.636	-	10.636

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	14.513	25.581	22.003	10.800	32.803	18.450	20.417	21.305	21.559	Continuing	Continuing
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	5.297	4.138	4.436	0.000	4.436	2.669	2.787	2.916	2.878	Continuing	Continuing
• RDTEN/0603207N/2341: *METOC DATA ACQUISITION*	20.859	15.288	6.083	0.000	6.083	6.802	6.807	6.981	6.940	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC SENSOR ENGINEERING*	2.483	1.597	1.486	0.000	1.486	1.472	1.508	1.531	1.546	Continuing	Continuing
• RDTEN/0305160N/0524: *NAVY METOC SUPPORT*	1.057	0.936	0.904	0.000	0.904	0.822	0.833	0.880	0.890	Continuing	Continuing

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.

E. Performance Metrics

Goal: Develop techniques and tools to assimilate meteorological and oceanographic (METOC) data in order to improve the accuracy of global and regional scale meteorological and oceanographic forecast models. Data assimilation is expanded to include new in-situ and remotely-sensed data types, based on operational need. Tasks are directed toward advanced techniques enabling assimilation of disparate sources on non-synoptic time scales. Acoustic, atmospheric, and oceanographic model development, prototyping and transition is focused on improved model physics, increased resolution, and computational efficiency.
Metric -- Tasks will address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL:Washington DC	102.569	6.050	Oct 2010	4.644	Oct 2011	-		4.644	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSCs:California, South Carolina	2.272	-		-		-		-	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various:Various	41.183	-		-		-		-	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	FFRDC	Univ. S. Miss.:Mississippi	2.413	-		-		-		-	0.000	2.413	
METOC Space-Based Sensing Capabilities	WR	NRL:Washington, DC	-	4.608	Oct 2010	2.445	Oct 2011	-		2.445	0.000	7.053	
Tactical Oceanography Capabilities / Undersea Warfare	WR	NRL:Washington, DC	-	2.130	Oct 2010	1.851	Oct 2011	-		1.851	0.000	3.981	
Tactical Oceanography Capabilities / Undersea Warfare	WR	University of Texas:TX	-	0.700	Dec 2010	0.598	Dec 2011	-		0.598	0.000	1.298	
Tactical Oceanography Capabilities / Undersea Warfare	WR	NSWC Carderock:West Bethesda, MD	-	0.450	Oct 2010	0.399	Oct 2011	-		0.399	0.000	0.849	
Tactical Oceanography Capabilities / Undersea Warfare	WR	NAVOCEANO:Mississippi	-	0.300	Oct 2010	0.249	Oct 2011	-		0.249	0.000	0.549	
		Subtotal	148.437	14.238		10.186		-		10.186			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	SSA/CSC:MISC	0.295	-		-		-		-	0.000	0.295	
	C/FP	SAIC:Virgina	-	0.473	Nov 2010	-		-		-	0.000	0.473	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342: *METOC Data Assimilation and Mod*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Littoral Battlespace Sensing - Autonomous Undersea Vehicle													
METOC Future Mission Capabilities	C/FP	SAIC:Virgina	-	0.200	Nov 2010	0.150	Nov 2011	-		0.150	0.000	0.350	
		Subtotal	0.295	0.673		0.150		-		0.150	0.000	1.118	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified:Not Specified	0.090	-		-		-		-	0.000	0.090	
METOC Space-Based Sensing Capabilities	C/FP	BAH:Virgina	-	0.400	Nov 2010	0.300	Nov 2011	-		0.300	0.000	0.700	
		Subtotal	0.090	0.400		0.300		-		0.300	0.000	0.790	

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	148.822	15.311		10.636		-		10.636			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342: *METOC Data Assimilation and Mod*	

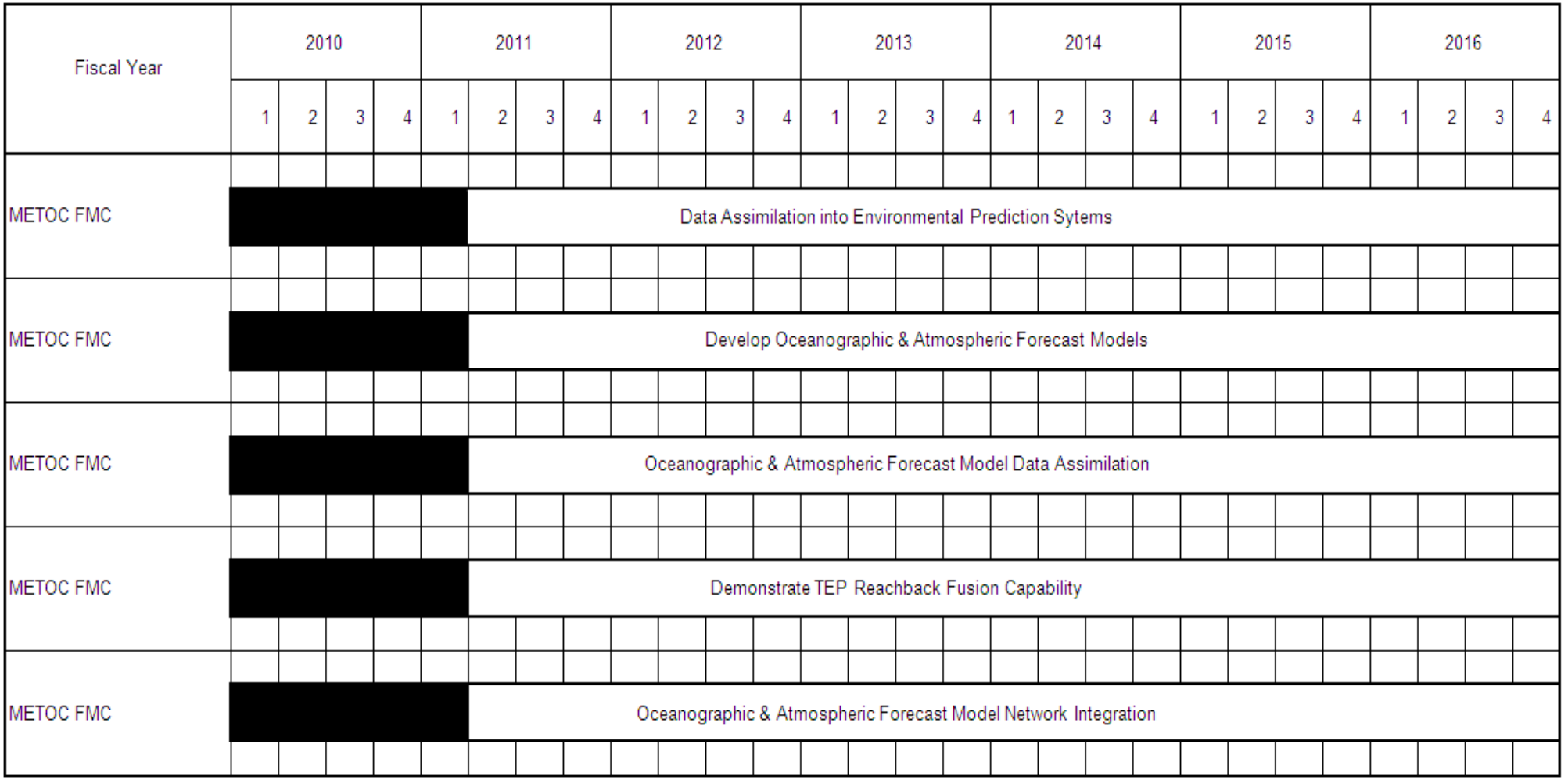

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		**DATE:** February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

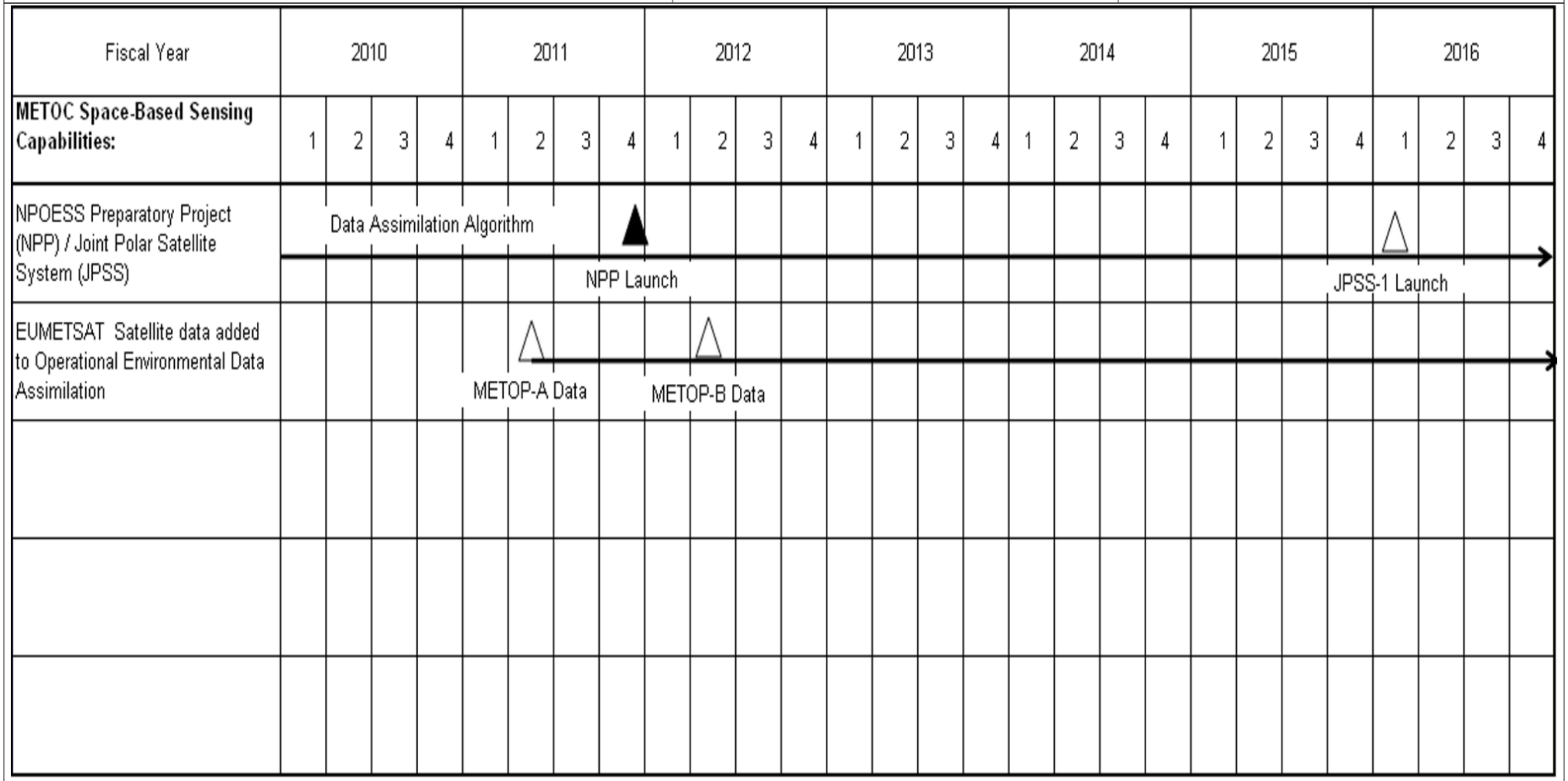

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342: *METOC Data Assimilation and Mod*

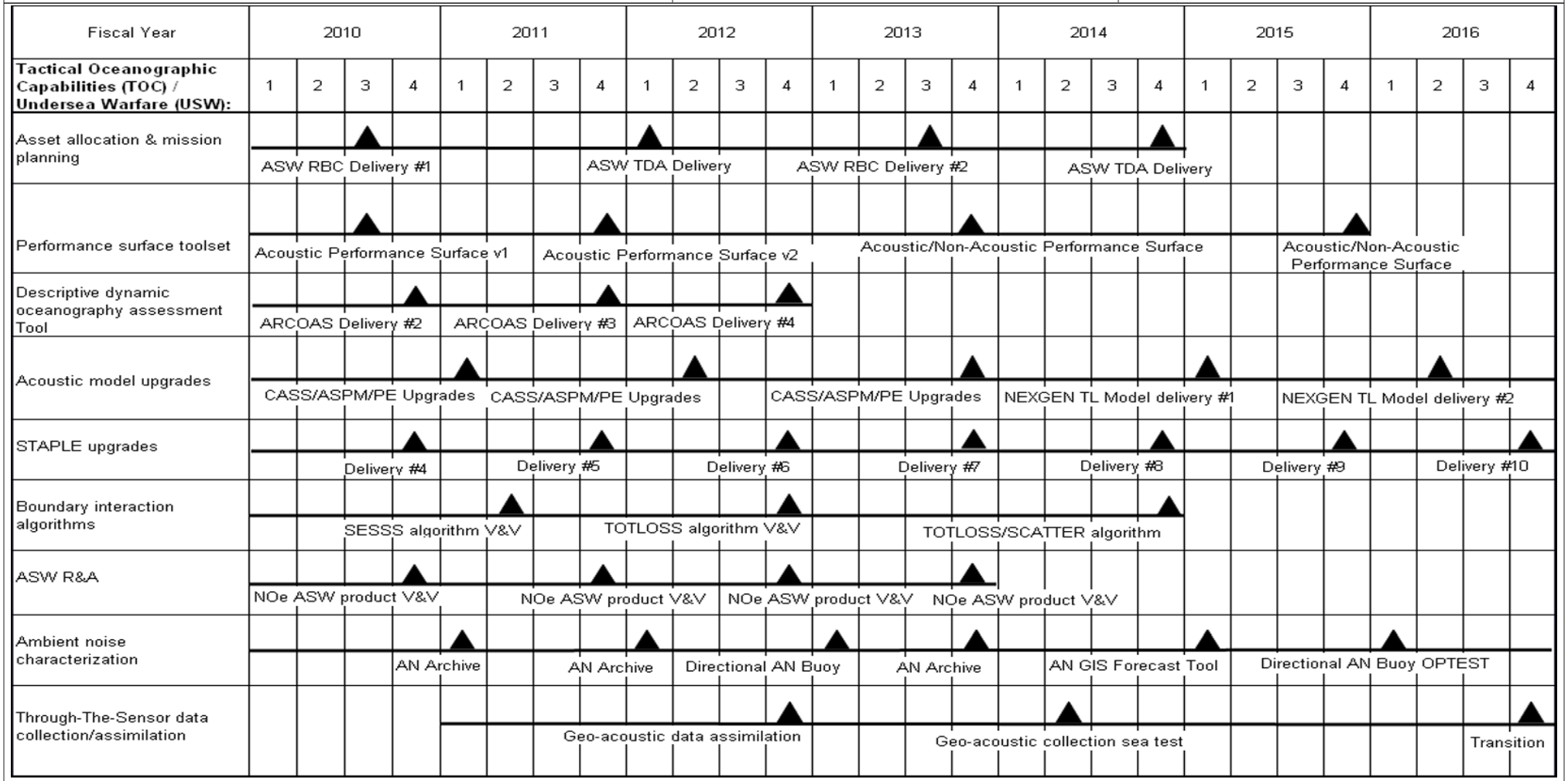

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2342				
METOC FMC Develop Oceanographic and Atmospheric Forecast Models	1	2010	4	2016
METOC FMC Oceanographic and Atmospheric Forecast Model Data Assimilation	1	2010	4	2016
METOC FMC Demonstrate TEP Reachback Fusion Capability	1	2010	4	2016
METOC FMC Oceanographic and Atmospheric Forecast Model Network Integration	1	2010	4	2016
METOC SPACE Data Assimilation Algorithm	1	2010	4	2016
METOC SPACE EUMETSAT Meteorological Operational satellites for European Organization for Exploitation of Meteorological Satellites (METOP) - A Satellite Data Assimilation	2	2011	2	2011
METOC SPACE National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) Launch	4	2011	4	2011
METOC SPACE METOP-B Satellite Data acquired and added to Operational Environment Data Assimilation	2	2012	2	2012
METOC SPACE Joint Polar Satellite System (JPSS) 1 Launch	1	2016	1	2016
TOC USW ASW Reachback (RBC) Delivery #1	3	2010	3	2010
TOC USW Acoustic Performance Surface v1	3	2010	3	2010
TOC USW ARCOAS Delivery #2	4	2010	4	2010
TOC USW Staple Upgrades Delivery #4	4	2010	4	2010
TOC USW NOe ASW Product V&V 1	4	2010	4	2010
TOC USW CASS/ASPM/PE Upgrades 1	1	2011	1	2011
TOC USW Ambient Noise (AN) Archive 1	1	2011	1	2011
TOC USW SESSS Algorithm V&V	2	2011	2	2011
TOC USW Acoustic Performance Surface v2	4	2011	4	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TOC USW ARCOAS Delivery #3	4	2011	4	2011
TOC USW STAPLE Upgrades Delivery #5	4	2011	4	2011
TOC USW NOe ASW Product V&V 2	4	2011	4	2011
TOC USW TDA Delivery 1	1	2012	1	2012
TOC USW Ambient Noise (AN) Archive 2	1	2012	1	2012
TOC USW CASS/ASPM/PE Upgrades 2	2	2012	2	2012
TOC USW ARCOAS Delivery #4	4	2012	4	2012
TOC USW STAPLE Delivery #6	4	2012	4	2012
TOC USW TOTLOSS Algorithm V&V	4	2012	4	2012
TOC USW NOe ASW Product V&V 3	4	2012	4	2012
TOC USW Geo-acoustic data assimilation	4	2012	4	2012
TOC USW Directional AN Buoy	1	2013	1	2013
TOC USW ASW RBC Delivery #2	3	2013	3	2013
TOC USW Acoustic / Non-Acoustic Performance Surface	4	2013	4	2013
TOC USW CASS/ASPM/PE Upgrades 3	4	2013	4	2013
TOC USW STAPLE Upgrades Delivery #7	4	2013	4	2013
TOC USW NOe ASW Product V&V 4	4	2013	4	2013
TOC USW Ambient Noise (AN) Archive 3	4	2013	4	2013
TOC USW Geo-acoustic collection sea test	2	2014	2	2014
TOC USW TDA Delivery 2	4	2014	4	2014
TOC USW STAPLE Upgrades Delivery #8	4	2014	4	2014
TOC USW TOTLOSS/SCATTER Algorithm	4	2014	4	2014
TOC USW AN GIS Forecast Tool	1	2015	1	2015
TOC USW NEXGEN TL Model Delivery #1	1	2015	1	2015

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342: *METOC Data Assimilation and Mod*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TOC USW Acoustic / Non-acoustic Performance Surface v2	4	2015	4	2015
TOC USW STAPLE Upgrades Delivery #9	4	2015	4	2015
TOC USW Directional AN Buoy OPTEST	1	2016	1	2016
TOC USW NEXGEN TL Model Delivery #2	2	2016	2	2016
TOC USW STAPLE Upgrade Delivery #10	4	2016	4	2016
TOC USW Through-the-Sensor (TTS) transition	4	2016	4	2016
Data Assimilation into Environmental Prediction Systems	1	2010	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
2343: *Tactical METOC Applications*	15.624	13.736	9.562	-	9.562	8.271	-	-	-	0.000	47.193
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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 in a net-centric environment. 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 software decision support tools 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, 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 integrated into net-centric visualization tools 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.

The major emphasis of this project is the software only Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program of record.

FY 2012 increase provides for the ramp up of NITES-Next Release 1 software development efforts including extensive system architecture and system design development and Configuration Management efforts.

Beginning in FY14 the Navy has canceled all Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program development efforts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	15.348	13.736	9.562	-	9.562

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Articles:	0	0	0		0
FY 2010 Accomplishments: Continued development of system architecture, system engineering, software development, test and integration activities for NITES-Next System Development and Demonstration (SDD) (or Engineering and Manufacturing Development (EMD)), including integration into next generation Electromagnetic and Electro-optical (EM/EO) and performance prediction systems. Conducted NITES-Next Release 1 System Readiness Review (SRR)/ System Functional Review (SFR) and System Design Review (SDR) involving lab, fleet and site testing and early Commander, Operational Test & Evaluation Force (COMOPTEVFOR) involvement. Initiated extensive NITES-Next software development across the multiple Computer Software Configuration Items. ***FY 2011 Plans:*** Conduct NITES-Next Design Readiness Review. Continue the development of NITES-Next Release 1 system architecture, system engineering, and software, including integration with next generation Electromagnetic and Electro-optical (EM/EO)and performance prediction systems. Conduct NITES-Next Release 1 Preliminary Design Review (PDR) and Critical Design Review (CDR) involving lab, fleet and site testing and early COMOPTEVFOR involvement. Continue Developmental Test and Evaluation efforts involving lab, fleet and site testing. ***FY 2012 Base Plans:*** Continue software Engineering and Manufacturing Development (EMD) efforts for NITES-Next Release 1. Continue the development of NITES-Next Release 1 system design including the software architecture design. Begin preparation for all Technical Readiness Reviews, Developmental Test and Evaluation (DT&E), and Initial Operational Test and Evaluation (IOT&E) efforts scheduled for FY 2013. Begin preparations for the award of the NITES-Next Release 2 contract option. All Release 1 contractor developmental test and evaluation activities have been deferred to FY 2013.					
Title: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	0.276	-	-	-	-
Articles:	0				
FY 2010 Accomplishments: Continued capability upgrades and validation of Next Generation electro-magnetic and electro-optic performance prediction systems and decision tools. Developed Through-the Sensor technologies to characterize atmospheric boundary layer parameters for Anti-Submarine Warfare applications.					
Accomplishments/Planned Programs Subtotals	15.624	13.736	9.562	-	9.562

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

C. Other Program Funding Summary ($ in Millions)

N/A

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 the Naval Integrated Tactical Environmental System Next Generation program under Joint Capabilities Integration and Development System (JCIDS) by the Department of the Navy (DoN).

E. Performance Metrics

Goal: Develop meteorological and oceanographic (METOC) future operational effects decision aid capabilities for Navy and Marine Corps war fighters in order to facilitate the characterization and prediction of the entire battle space.

Metric: Improve the accuracy of meteorological and oceanographic tactical decision aids and applications in order to address no less than 75% of applicable capability gaps and requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NRL:Washington, DC	3.893	-		-		-		-	0.000	3.893	
NITES/NITES-Next	WR	SSCs:California, South Carolina	7.323	1.350	Oct 2010	0.800	Oct 2011	-		0.800	0.000	9.473	
NITES/NITES-Next	Various	Various:Various	5.775	-		-		-		-	0.000	5.775	
NITES	Various	Various:Various	61.400	-		-		-		-	0.000	61.400	
NITES-Next	C/CPIF	GD-IT:Viginia	15.415	10.136	Nov 2010	7.387	Nov 2011	-		7.387	0.000	32.938	
NITES-Next	WR	NAVOCEANO:Mississippi	-	0.125	Oct 2010	0.125	Oct 2011	-		0.125	0.000	0.250	
		Subtotal	93.806	11.611		8.312		-		8.312	0.000	113.729	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Cost	C/CPIF	IPD:Various	0.595	-		-		-		-	0.000	0.595	
NITES-Next	C/FP	SAIC:Virgina	-	1.600	Nov 2010	0.950	Nov 2011	-		0.950	0.000	2.550	
NITES-Next	C/FP	NAVAIR:Maryland	-	0.125	Oct 2010	-		-		-	0.000	0.125	
		Subtotal	0.595	1.725		0.950		-		0.950	0.000	3.270	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various:Various	0.031	-		-		-		-	0.000	0.031	
NITES-Next	WR	SSC Pacific:San Diego, CA	-	-		-		-		-	0.000	0.000	
NITES-Next	C/FP	BAH:Virgina	-	0.400	Nov 2010	0.300	Nov 2011	-		0.300	0.000	0.700	
		Subtotal	0.031	0.400		0.300		-		0.300	0.000	0.731	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*	

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	94.432	13.736		9.562		-		9.562	0.000	117.730	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2343: *Tactical METOC Applications*

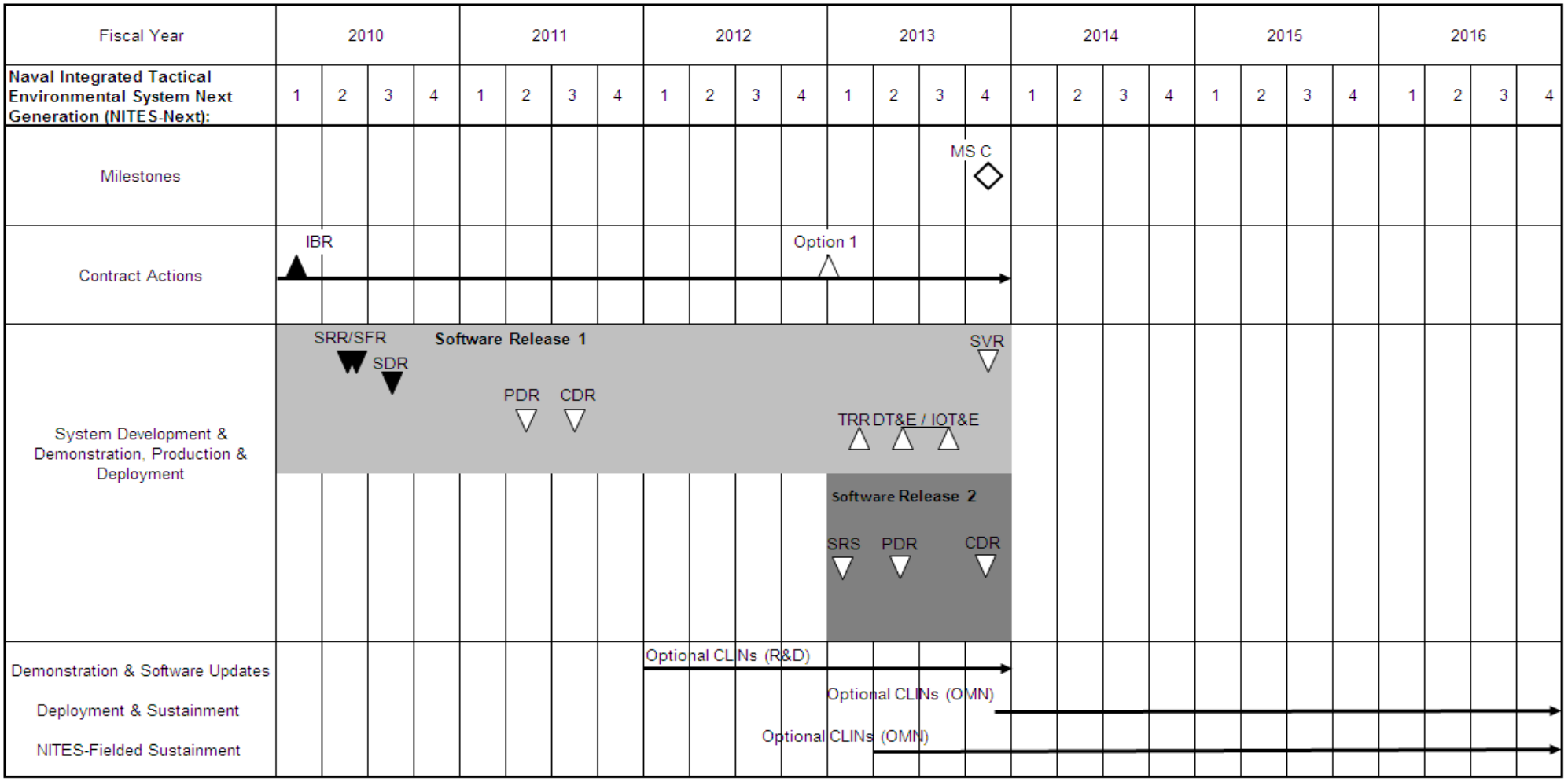

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2343: *Tactical METOC Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2343				
NITES-Next Contract Actions	1	2010	4	2013
NITES-Next Initial Base Review (IBR)	1	2010	1	2010
NITES-Next Release 1: System Readiness Review (SRR) / SFR	2	2010	2	2010
NITES-Next Release 1: System Design Review (SDR)	3	2010	3	2010
NITES-Next Release 1: Production Design Review (PDR)	2	2011	2	2011
NITES-Next Release 1: Critical Design Review (CDR)	3	2011	3	2011
NITES-Next Contract Option 1	4	2012	1	2013
NITES-Next Release 1: Technical Readiness Review (TRR)	1	2013	1	2013
NITES-Next Release 2: SRS	1	2013	1	2013
NITES-Next Release 1: Development, Test, & Eval (DT&E) / IOT&E	2	2013	3	2013
NITES-Next Release 2: Production Design Review (PDR)	2	2013	2	2013
NITES-Next MS C	4	2013	4	2013
NITES-Next Release 1: SVR	4	2013	4	2013
NITES-Next Demo & Software Updates Optional CLINs (R&D)	1	2012	4	2013
NITES-Next Deployment & Sustainment Optional CLINs (OMN)	4	2013	4	2016
NITES-Fielded Sustainment Optional CLINs (OMN)	2	2013	4	2016
NITES-Next Release 2: Critical Design Review (CDR)	4	2013	4	2013

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
2344: *Precise Timing and Astronomy*	2.216	2.118	1.025	-	1.025	1.043	1.014	1.023	0.982	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The major thrust of the Precise Timing and Astrometry Project 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Precise Timing and Astronomy	2.216	2.118	1.025	-	1.025
Articles:	0	0	0		0
FY 2010 Accomplishments: Completed fabrication of four Rubidium (Rb) Fountain systems; completed installation and testing of Alternate Fountain Master Clock environmental systems. Completed contract preparation and award for unique capabilities Global Positioning System (GPS) M Code Timing Receiver. Began development, installation and testing of electronic Very Long Base-Line Interferometry (eVLBI) wide-band data connectivity capability.					
FY 2011 Plans: Complete installation and operational testing of the complete Master Clock systems installation at U.S. Naval Observatory (USNO), DC. Continue development of and begin production of the GPS-III M-Code Timing					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Receiver. Continue the development, installation and testing of electronic eVLBI wide-band data connectivity capability. ***FY 2012 Base Plans:*** Transport Rb Fountain Master Clock (MC) 5, 6 and 7 to the United States Naval Observatory (USNO) Alternate Master Clock (AMC) site. Demonstrate Initial Operating Capability (IOC) of the three Rb Fountain MC at the AMC. Conduct Operational Testing (OT) on the first production of GPS M-Code timing receiver. Complete Critical Design Review of software (SW) correlator on eVLBI for automated Earth Orientation Parameters and demonstrate SW correlator utilizing wide-band internet transmission of VLBI data from all VLBI sites.					
Accomplishments/Planned Programs Subtotals	2.216	2.118	1.025	-	1.025

C. Other Program Funding Summary ($ in Millions)

N/A

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 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 infrared 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.

E. Performance Metrics

Goal: Address Navy/DoD requirements for needed increases in positioning accuracies of modern weapons systems by the determination of star positions, oversee the determination and dissemination of precise time information using the Navy/DoD Master Clock System and precise time distribution networks.

Metric: Measurable progress toward stated GPS-III requirement to meet or exceed a 2 sigma accuracy of 0.5 nanoseconds (ns) for the M Code Rx error and 0.1ns Master Clock error. Improve star position accuracy to within 10 milliarcseconds in support of National Technical Means (classified) program requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2344: *Precise Timing and Astronomy*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	Naval Observatory:Washington, DC	16.554	2.118	Oct 2010	1.025	Oct 2011	-		1.025	0.000	19.697	
Precise Timing & Astrometry	Various	Various:Various	19.144	-		-		-		-	0.000	19.144	
		Subtotal	35.698	2.118		1.025		-		1.025	0.000	38.841	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various:Various	0.099	-		-		-		-	0.000	0.099	
		Subtotal	0.099	-		-		-		-	0.000	0.099	

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.797	2.118		1.025		-		1.025	0.000	38.940	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2344: *Precise Timing and Astronomy*

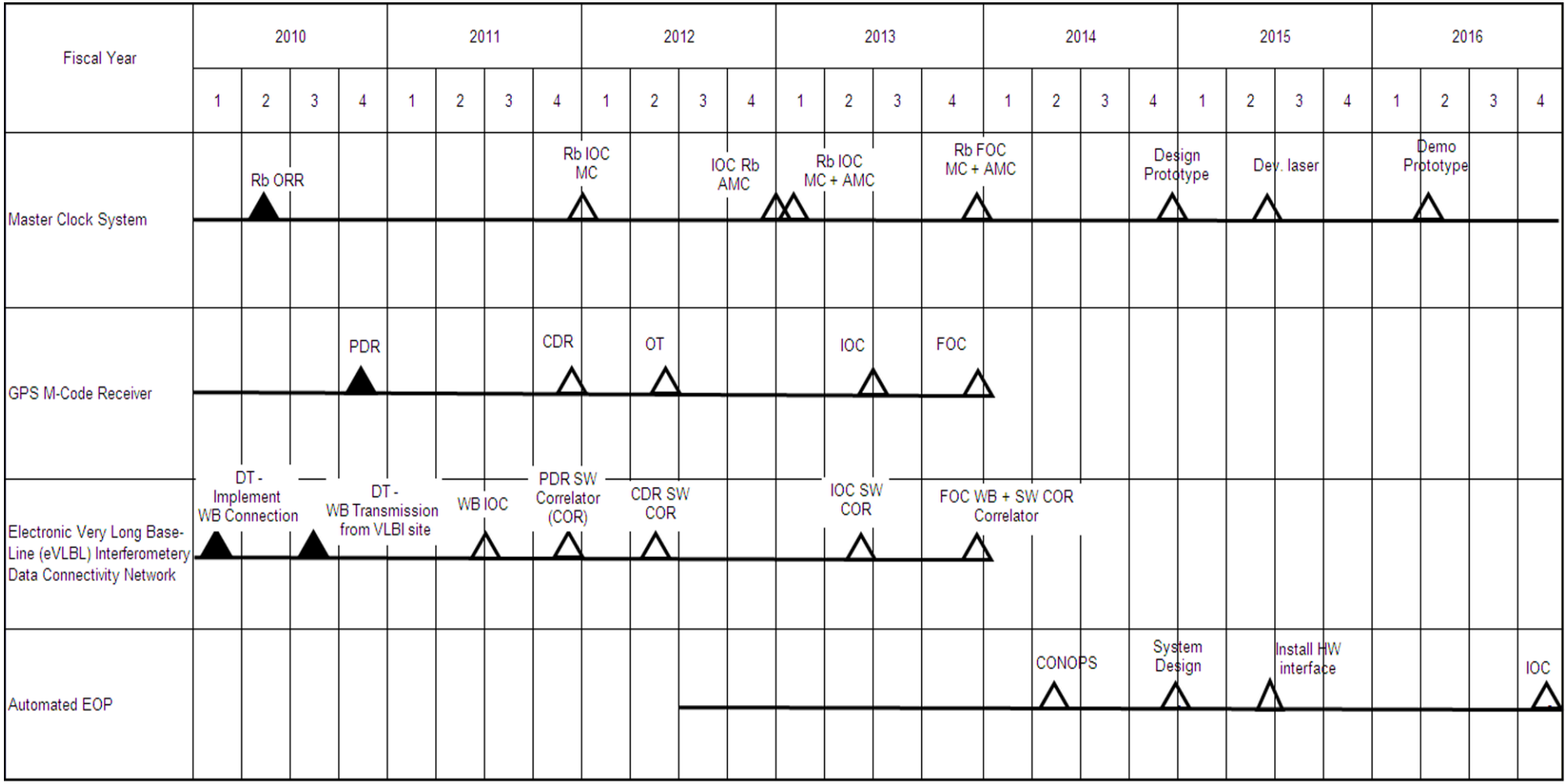

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2344: *Precise Timing and Astronomy*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2344				
Master Clock Sys	1	2010	4	2016
Master Clock Sys: Rb Operational Readiness Review (ORR)	2	2010	2	2010
Master Clock Sys: Rb Initial Operational Capability (IOC) - Milestone C (MC)	4	2011	1	2012
Master Clock Sys: IOC Rb Alternate Master Clock (AMC)	4	2012	1	2013
Master Clock Sys: Rb & AMC Initial Operational Capability (IOC) - MC	1	2013	1	2013
Master Clock Sys: Rb & AMC Full Operational Capability (FOC) - MC	4	2013	1	2014
Master Clock Sys: Design Prototype	4	2014	1	2015
Master Clock Sys: Develop Laser	2	2015	3	2015
Master Clock Sys: Demonstrate Prototype	2	2016	2	2016
GPS M-Code Receiver	1	2010	4	2013
GPS M-Code Receiver: Preliminary Design Review (PDR)	4	2010	4	2010
GPS M-Code Receiver: Critical Design Review (CDR)	4	2011	4	2011
GPS M-Code Receiver: OT	2	2012	2	2012
GPS M-Code Receiver: IOC	2	2013	3	2013
GPS M-Code Receiver: FOC	4	2013	1	2014
Electronic Very Long Base-Line (eVLBL) Interferometery Data Connectivity Network	1	2010	4	2013
eVLBL: DT - Implement Wide Band (WB) Connection	1	2010	1	2010
eVLBL: DT - WB Transmission from VLBI site	3	2010	3	2010
eVLBL: WB IOC	2	2011	3	2011
eVLBL: PDR Software (SW) Correlator (COR)	4	2011	4	2011
eVLBL: CDR SW Correlator	2	2012	2	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2344: *Precise Timing and Astronomy*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
eVLBL: IOC SW COR	2	2013	2	2013
eVLBL: FOC WB & SW COR	4	2013	4	2013
Automated Earth Orientation Parameters (EOP)	3	2012	4	2016
EOP: CONOPS	2	2014	2	2014
EOP: System Design	4	2014	1	2015
EOP: Install Hardware (HW) Interface	2	2015	2	2015
EOP: IOC	4	2016	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
3207: *Fleet Synthetic Training*	0.973	3.437	0.968	-	0.968	1.041	1.065	1.086	1.105	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Fleet Synthetic Training (FST) provides 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 will 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 develops and delivers 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.

To support Fleet readiness the Navy has established a persistent training environment. It enables the use of modeling and simulation in support of FST. Navy's Fleet Training Continuum (NCTE) satisfies this requirement by providing the infrastructure and connectivity required for distributed simulation-based training, events, and exercises. The JSAF simulation provides the core model for maritime constructive representation and stimulation for Navy Training and Joint Training events.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Fleet Synthetic Training	0.973	3.437	0.968	-	0.968
Articles:	0	0	0		0
Description: Accomplishments planned include the stability and robustness improvements to support Fleet Synthetic Training. Improved capability of Automated Status Boards and Link 16 Information Display for the Tactical Training Group Schoolhouses. Improved capability of Class III and V Logistics, Theater Battle Management Core Systems mission support interface, and Intel fidelity (Electronic Intelligent (ELINT)) in support of Navy requirements. Improved capability in support of virtual and constructive users such as: Manned Flight Systems' H-60R and H-60S trainers. Accomplishments include development of meteorological and oceanographic environmental databases for total of 10 of 14 NCTE exercise areas. Conducted data and architecture testing between CNMOC data and the Environmental Data Cube Support system. Integrated environmental database hosting at the Naval Oceanographic Office. Developed capability to realistically simulate bathythermograph data collection based on synthetic ocean environment for total of 6 of 14 NCTE areas. Enhanced realism of training environment					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
by providing synthetic satellite/radar imagery based on synthetic environmental data. Made improvements in generating acoustic performance products used by ASW white cell and ASW commander staff. Conducted verification and validation of acoustic performance products. ***FY 2010 Accomplishments:*** - Develop environmental archive data for 4-6 additional NCTE exercise areas per NWDC specifications. - Test and evaluate link between claimancy data architecture and architecture for data provision in support of NCTE. - Develop GCCS-M overlays of performance surface products. - Implement ocean data query capability. - Continue to refine and automate the process for producing performance surface products as required. - Develop additional synthetic point data and field imagery products. ***FY 2011 Plans:*** - Develop environmental archive data for 4-6 additional NCTE exercises areas per NWDC specifications. - Refine link between claimancy data architecture and architecture for data provision in support of NCTE as required. - Continue to automate the process for producing performance surface products as required. - Develop additional synthetic point data and field imagery products. - Research feasibility of providing live data in support of synthetic training events. - Research implementation of climatology products into Fleet Synthetic Training. - Develop fleet-required capabilities and enhancements to the Navy Continuous Training Environment (NCTE) and Joint Semi-Automated Forces (JSAF) Navy software application baselines. Navy will further develop capabilities to address emerging threats, specifically in the areas of Strike Warfare, Ballistic Missile Defense and Information Operations. Without these funds, CSG and ESG Strike Warfare staffs will be unable to build required proficiencies for integrated Joint training events; Navy training systems will not share a common training environment due to lack of alignment between systems for common order of battle, electronic emitter data, and acoustic signature data; Emergent order of battle changes, blue force capabilities, and evolving TTPs will not be represented in FST, limiting the ability of the Tactical Training Groups, JWFC, and NWDC to provide a high-fidelity training environment. JSAF's ability to continue to increase scenario size in support of FST-O (Operational Level of War) will be curtailed, reducing training effectiveness. CSG and ESG					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Intel staff will not build required proficiencies for Information Operations in integrated Joint training events Air Missile Defense: CSG and ESG forces will not be able to train to joint Ballistic Missile Defense (BMD) tasks. Additional research and development activities will focus on the Next Generation NCTE Network Architecture. Research and development of a new MSPP/MPLS architecture is a fundamental imperative to providing a seamless transition into the DISA backbone network beyond 2015. The development of the new MSPP/MPLS architecture cannot continue without the experienced and expert personnel to (a) develop cooperating networks integration strategies (GIG, JTEN, DMON) and (b) evaluate WAN industry trend analysis best practices. The Navy Training Baseline JSAF and other Virtual and Constructive components will be correlated with Live players, significantly upgrading common ground truth. Intensified terrain is required for every FST AOR, as the NCTE "world thin" terrain will contain areas of high definition for entities to transit through successfully, resulting in increased planning and developing of scenarios to support wargaming. Order of battle change implementation activities are enhanced reducing developer time; FST planners will be able to use the existing Link-16 model in the Navy Training Baseline JSAF and the supporting services in the NCTE to represent Link-11 platform operations; and FST events and Joint and COCOM wargames that require the use of unclass/ releasable JSAF can be supported, enhancing Live, Virtual and Constructive operations. ***FY 2012 Base Plans:*** - Increase environmental data archive to 10 years. - Begin development of global ocean model data archive. - Research implementation of additional performance surface capabilities. - Begin implementation of climatology products into Fleet Synthetic Training. - Develop capability of providing live data in support of synthetic training events. - Develop new products in response to NWDC demand signal.					
Accomplishments/Planned Programs Subtotals	0.973	3.437	0.968	-	0.968

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

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

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*

E. Performance Metrics

1) CNMOC will produce meteorological and oceanographic environmental databases for 4 or 14 NCTE exercise areas. Will implement, test, and integrate with JSAF and other federates in accordance with requirements.

2) CNMOC will complete data and architecture integration, including information assurance compliance for provision of synthetic METOC data to the NCTE.

3) CNMOC will produce bathythermographic data profiles based on synthetic ocean environment and synthetic satellite/ radar imagery based on meteorological environmental data for 4 of 14 NCTE exercise areas.

4) Navy Warfare Development Command (NWDC) will research and develop the software and associated efforts to include documentation; will design and implement upgrades to JSAF consistent with approved requirements and CRs and document the effects of JSAF capabilities (robustness) and stability. Will design, implement, test, and integrate JSAF enhancements in accordance with requirements. NWDC will deliver JSAF Version 5.0 that will include this newly developed software.

5) NWDC will produce a Next Generation Architecture that meets all DISA and Navy requirements. The architecture will include a Bill of Material (BOM) for the prototype equipment, and a transition plan for the 72+ nodes within the NCTE.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3207: *Fleet Synthetic Training*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	Alion:Fairfax, VA	-	2.600	Oct 2010	-		-		-	0.000	2.600	
		Subtotal	-	2.600		-		-		-	0.000	2.600	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NRL / AER:MS / CA / VA	0.565	0.637	Nov 2010	0.561	Nov 2011	-		0.561	0.000	1.763	
Software Development	WR	AER / GEOCENT:VA / MS	0.200	0.100	Nov 2010	0.307	Nov 2011	-		0.307	0.000	0.607	
Configuration Management	WR	AER / GEOCENT:VA / MS	0.099	0.100	Feb 2011	0.100	Feb 2012	-		0.100	0.000	0.299	
Studies and Analysis	Various	Various:Various	0.109	-		-		-		-	0.000	0.109	
		Subtotal	0.973	0.837		0.968		-		0.968	0.000	2.778	

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.973	3.437		0.968		-		0.968	0.000	5.378	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3207: *Fleet Synthetic Training*

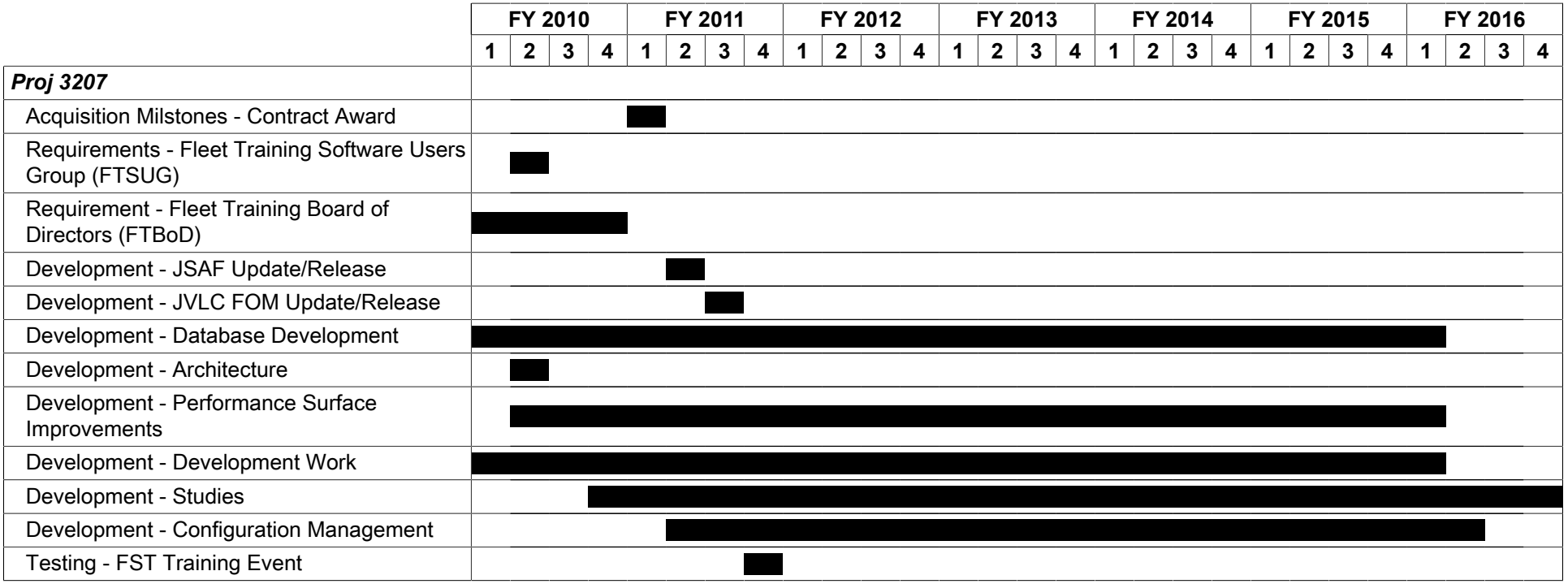

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3207: *Fleet Synthetic Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3207				
Acquisition Milstones - Contract Award	1	2011	1	2011
Requirements - Fleet Training Software Users Group (FTSUG)	2	2010	2	2010
Requirement - Fleet Training Board of Directors (FTBoD)	1	2010	4	2010
Development - JSAF Update/Release	2	2011	2	2011
Development - JVLC FOM Update/Release	3	2011	3	2011
Development - Database Development	1	2010	1	2016
Development - Architecture	2	2010	2	2010
Development - Performance Surface Improvements	2	2010	1	2016
Development - Development Work	1	2010	1	2016
Development - Studies	4	2010	4	2016
Development - Configuration Management	2	2011	2	2016
Testing - FST Training Event	4	2011	4	2011

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
3229: *JMAPS*	52.765	73.441	66.698	-	66.698	32.904	5.828	5.887	5.849	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Joint Milli-Arcsecond Pathfinder Survey (JMAPS) program. Joint strike operations require extremely accurate Positioning, Navigation, and Timing (PNT) systems in order to locate hostile threats with space-borne Intelligence Surveillance and Reconnaissance (ISR) systems, and then to deliver ordnance on precisely selected targets. The Navy 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 accuracy and the resultant weapon system accuracy. The accuracy of star positions (hence ability to hit desired target) 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. 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. The JMAPS 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: JMAPS	52.765	73.441	66.698	-	66.698
Articles:	0	0	0		0
FY 2010 Accomplishments: Completed engineering analysis and conceptual design work required for the System Requirements Review including some risk reduction by maturing a single focal plane array and the astrometric and band pass filters. In addition, the program began the preliminary design activities for the instrument, spacecraft and ground systems. Phase A activities for the System Requirements Review included mission and system requirements analysis, engineering analysis of spacecraft attitude determination and control system and spacecraft design to include preliminary thermal requirements, and detailed system performance specifications from mission concept design and requirements definition. Technology risk reduction activities included the advanced development of low-noise focal plane arrays, as well as the astrometric and band pass filters. Phase B activities supported a Preliminary Design Review to include maturing the instrument, spacecraft and ground system design and the procurement of long-lead items. Procurement of the space bus, telescope and					

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
focal plane array were initiated. Additional engineering analysis was performed to evaluate the developing technologies for performance and mission satisfaction. ***FY 2011 Plans:*** Complete Phase B with a Preliminary Design Review, including a mature instrument, spacecraft, and ground system design and begin the activities and engineering analysis required for the Critical Design Review. Milestone B will be conducted. Phase C activities include the completion of a detailed design for the instrument, spacecraft and ground system in support of a Critical Design Review and Milestone C. End to end performance analysis will be conducted to verify that the system and new technologies are sufficiently mature to satisfy mission requirements. Upon Milestone C approval, the program will begin Phase D by initiating the procurement of remaining sub-system and components of the instrument, spacecraft and ground system. FY 2011 Funding increase is associated with the continuation and increase in efforts associated with the space bus and various Naval Research Laboratory (NRL) integration efforts as well as the beginning of efforts for the sensor chip assembly. ***FY 2012 Base Plans:*** Beginning in FY 2012 the spacecraft bus, telescope, and focal plane assembly will be delivered and integrated. Space vehicle integration testing as well as environmental testing will be performed. Test Readiness Review will be performed. Launch plans will be approved and launch preparations will commence.					
Accomplishments/Planned Programs Subtotals	52.765	73.441	66.698	-	66.698

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

JMAPS was started as an S&T government activity. JMAPS is planned to transition to an ACAT II acquisition program at Milestone B. JMAPS is a one-of-a-kind space-based optical system based on the development of several ongoing S&T activities. Due to the unique expertise and desire to maintain a core capability of critical skills within the Navy's space system development workforce, JMAPS is an in-house government program executed through the Naval Research Laboratory (NRL) and The US Naval Observatory (USNO). Contract mechanisms at NRL and USNO by the Office of Naval Research with oversight by PEO Space Systems.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

JMAPS will continue development and execution of the program in parallel with the efforts required to transition the program to an acquisition system by Milestone B in 2011.

E. Performance Metrics

The JMAPS program will update the currently degrading celestial catalog to meet current and future war fighter requirements. The JMAPS catalog will provide 1 milli-arcsecond position accuracy and 1 milli-arcsecond proper motion of the bright stars, magnitude 1 through 12, no later than 2017. The JMAPS program will provide photometric accuracy better than 7% in three wavelength bands from 450nm to 750nm.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration of components	WR	Naval Research Laboratory:Washington, DC	-	32.152	Nov 2010	27.243	Nov 2011	-		27.243	Continuing	Continuing	Continuing
Space Bus/Satellite Materials	SS/CPFF	AeroAstro, Inc.:Ashburn, VA	-	29.359	Nov 2010	1.032	Dec 2011	-		1.032	Continuing	Continuing	Continuing
Optical Telescope	SS/CPFF	L3 Communications SSG:Tinsley, Wilmington, MA	-	0.474	Dec 2010	4.400	Jan 2012	-		4.400	0.000	4.874	4.500
Sensor Chip Assembly	SS/CPFF	Teledyne Scientific & Imaging (AKA Rockwell Intl.):Camarillo, CA	-	1.998	Dec 2011	4.000	Jan 2012	-		4.000	0.000	5.998	4.000
Technical Integration	C/CPFF	Orbital Science Corporation:Greenbelt, MD	-	0.800	Jan 2011	0.800	Jan 2012	-		0.800	Continuing	Continuing	Continuing
Engineering	SS/CPFF	Computational Physics:Springfield, VA	-	0.700	Jan 2011	0.625	Jan 2012	-		0.625	Continuing	Continuing	Continuing
Launch Vehicle	MIPR	Launch Vehicle Acquisition Office:Albuquerque, NM	-	-		21.265	Oct 2011	-		21.265	Continuing	Continuing	Continuing
Ground Systems Development	WR	United States Naval Observatory:Washington, DC	-	3.670	Nov 2010	3.248	Nov 2011	-		3.248	Continuing	Continuing	Continuing
Ground Systems Development	C/CPFF	CPI:Springfield, VA	-	2.090	Oct 2010	2.010	Oct 2011	-		2.010	Continuing	Continuing	Continuing
System Requirements Review (SRR)_10	Various	Various:Various	52.765	-		-		-		-	0.000	52.765	
		Subtotal	52.765	71.243		64.623		-		64.623			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Performance Analysis, Systems Engineering	C/CPFF	MANDEX, Inc.:Arlington, VA	-	0.358	Nov 2010	0.375	Nov 2011	-		0.375	Continuing	Continuing	Continuing
Trade-Off Studies	C/CPFF	AEROSPACE:Albuquerque, NM	-	0.200	Jan 2011	-		-		-	0.000	0.200	0.200
Systems and Technical Support	Various	Universities/ Colleges:Various	-	0.150	Feb 2011	0.100	Feb 2012	-		0.100	Continuing	Continuing	Continuing
		Subtotal	-	0.708		0.475		-		0.475			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	SS/CPFF	Accenture:San Diego, CA	-	0.365	Dec 2011	0.375	Dec 2011	-		0.375	Continuing	Continuing	Continuing
PMO Support	SS/CPFF	ITS:Arlington, VA	-	1.125	Apr 2011	1.225	Apr 2012	-		1.225	Continuing	Continuing	Continuing
		Subtotal	-	1.490		1.600		-		1.600			

	Total Prior Years Cost	FY 2011 Cost	FY 2011	FY 2012 Base Cost	FY 2012 Base	FY 2012 OCO Cost	FY 2012 OCO	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	52.765	73.441		66.698		-		66.698			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 3229: *JMAPS*

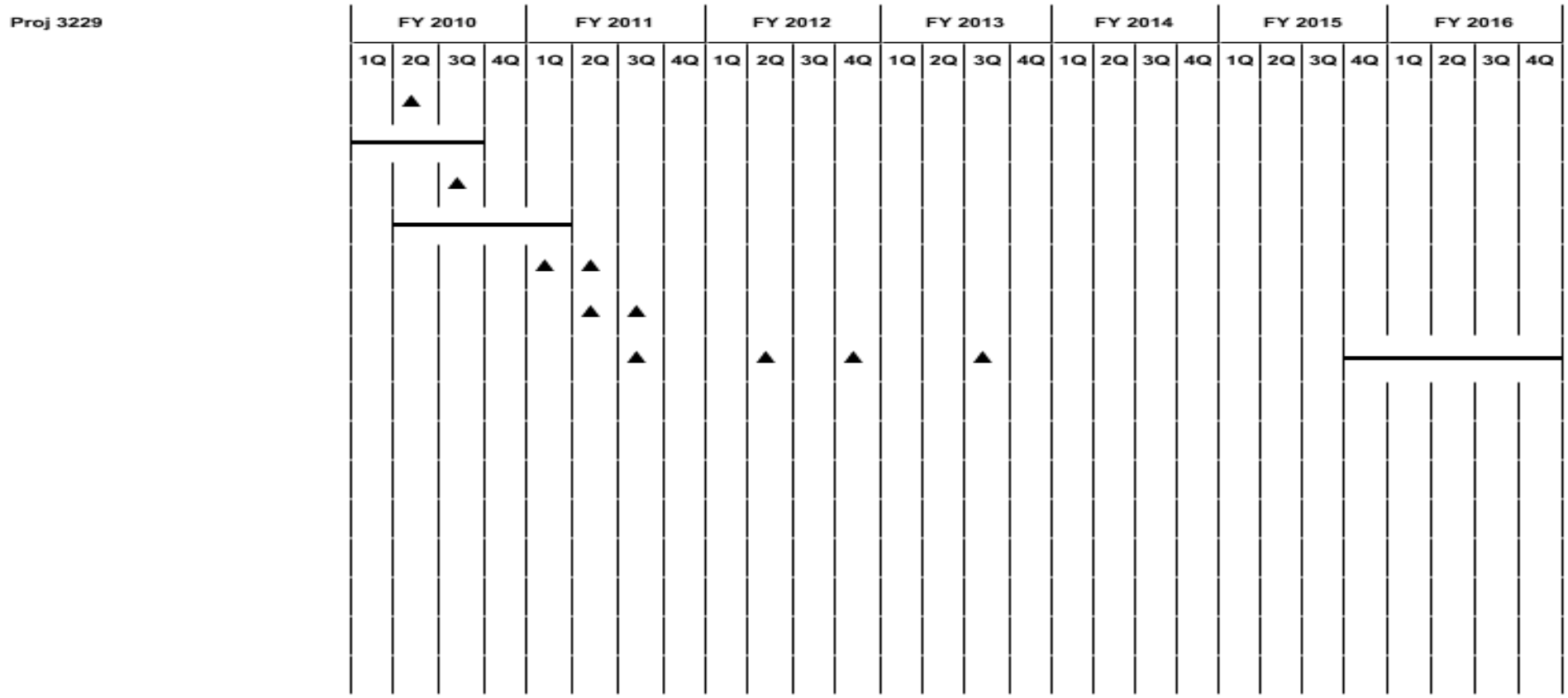

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3229: *JMAPS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3229				
Pre-Phase A Development -- Milestone - A	2	2010	2	2010
Phase A Development -- Concept Development	1	2010	3	2010
Phase A Development -- System Requirements Review (SRR)	3	2010	3	2010
Phase A Development -- Capability Development Document (CDD) Development	2	2010	1	2011
Phase A Development -- Preliminary Design Review	1	2011	1	2011
Phase A Development -- Milestone - B	2	2011	2	2011
Phase B Development -- Milestone - C	2	2011	2	2011
Phase C Development -- Critical Design Review	3	2011	3	2011
Phase C Development -- Milestone - D	3	2011	3	2011
Phase D Build -- Bus Delivery	2	2012	2	2012
Phase D Build -- Space Vehicle Test Readiness Review (TRR)	4	2012	4	2012
Phase D Build -- Launch	3	2013	3	2013
Star Catalog Development -- Interim Catalog Delivery	4	2015	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
9999: *Congressional Adds*	1.394	-	-	-	-	-	-	-	-	0.000	1.394
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional adds.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011
Congressional Add: Semi-Submersible UUV	1.394	-
FY 2010 Accomplishments: Continued the design and development efforts for a Semi-Submersible Unmanned Underwater Vehicle.		
Congressional Adds Subtotals	1.394	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Congressional adds.

E. Performance Metrics

Congressional adds.