Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy											DATE: April 2013	
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)	**All Prior Years**	**FY 2012**	**FY 2013#**	**FY 2014 Base**	**FY 2014 OCO ##**	**FY 2014 Total**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**Cost To Complete**	**Total Cost**
Total Program Element	572.743	46.274	34.085	42.246	-	42.246	46.862	44.387	46.550	48.038	Continuing	Continuing
2341: *METOC Data Acquisition*	143.699	5.921	6.702	6.336	-	6.336	6.909	6.838	6.990	7.087	Continuing	Continuing
2342.: *METOC Data Assimilation and Mod*	164.133	10.295	14.127	15.235	-	15.235	18.646	19.072	21.637	21.961	Continuing	Continuing
2343: *Tactical METOC Applications*	108.168	9.323	9.172	8.908	-	8.908	11.195	15.690	15.500	16.529	Continuing	Continuing
2344.: *Precise Time and Astrometry*	37.915	0.999	3.043	8.914	-	8.914	7.223	1.682	1.299	1.317	Continuing	Continuing
3207: *Fleet Synthetic Training*	0.943	0.936	1.041	2.853	-	2.853	2.889	1.105	1.124	1.144	Continuing	Continuing
3229: *JMAPS*	117.885	18.800	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	136.685

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

The Air Ocean Tactical Applications (AOTA) Program Element is aligned with the Navy's maritime strategy to enhance the future mission capabilities of the Navy-Marine Corps Meteorological and Oceanographic (METOC) Team supporting naval warfighters worldwide. New state-of-the art government and commercial technologies are identified, transitioned, demonstrated and then integrated into Combat Systems and programs of record to provide capabilities that provide real-time and near-real-time 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. This program element develops technological upgrades for the U.S. Naval Observatory's Master Clock system to meet requirements 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 2014 Navy	DATE: April 2013
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 METOC Future Mission Capabilities, the METOC Space-Based Sensing Capabilities, the Precise Timing and Astrometry, the Fleet Synthetic Training, the Tactical Oceanographic Capabilities for Under Sea Warfare and the Earth System Prediction Capability projects.

B. Program Change Summary ($ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	84.962	34.085	30.931	-	30.931
Current President's Budget	46.274	34.085	42.246	-	42.246
Total Adjustments	-38.688	0.000	11.315	-	11.315
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-37.898	0.000			
• SBIR/STTR Transfer	-0.790	0.000			
• Program Adjustments	0.000	0.000	7.905	-	7.905
• Rate/Misc Adjustments	0.000	0.000	3.410	-	3.410

Change Summary Explanation

Technical: Added funding to Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program development efforts in FY14.
FY14 funding added for technical development, shipboard installation, and additional personnel required to conduct Fleet Synthetic Training (FST) at sea for Ballistic Missile Defense (BMD).
Beginning in FY14 the Ocean Observing System Security Group (OOSSG) will begin to design, develop, demonstrate and transition a geospatially-enabled global ocean observing system database designed to characterize national and international ocean observatories locations, sensor grid capabilities and mitigations to address potential U.S. submarine security vulnerabilities.
Schedule: The schedule for the NITES-Next program of record has been updated to reflect the programs development efforts after FY13.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2341: *METOC Data Acquisition*	143.699	5.921	6.702	6.336	-	6.336	6.909	6.838	6.990	7.087	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

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).

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 typically have dynamic and complex 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 METOC Future Mission Capabilities (FMC) and the Tactical Oceanographic Capabilities project.

FY 2014 request provides for continued advanced development of software and hardware component and prototype efforts associated with acquiring environmental data, and METOC data dissemination, storage, delivery, design, development efforts, and develop METOC network integration capability.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 2012	FY 2013	FY 2014
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	5.609	6.390	5.984
Articles:	0	0	0
FY 2012 Accomplishments: Continued advanced component and prototype efforts associated with acquiring environmental data. Continued 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. 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 Meteorological & Oceanography (METOC) production centers and throughout the fleet user base. Developed advanced data acquisition, data processing and analysis techniques for GI&S, oceanographic and atmospheric data and information. Developed METOC data and product delivery technologies.			
FY 2013 Plans: Continue advanced component and prototype development efforts associated with acquiring environmental data and develop advanced techniques for 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 and develop advanced technologies and techniques to improve GI&S capabilities within Navy METOC product production centers and throughout the fleet user base. Continue to develop technologies that use tactical detection systems where applicable to characterize undersea and atmospheric environment in the battlespace. Begin Through-the-Sensor (TTS) development and demonstration. Develop METOC network integration capability and continue to develop systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products.			
FY 2014 Plans: Continue advanced component and prototype development efforts associated with acquiring environmental data and develop advanced techniques for 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 to develop technologies that use tactical detection systems where applicable to characterize undersea and atmospheric environment in the battlespace. Develop and demonstrate in-situ sampling techniques to support adaptive and advance measurement technologies. Develop techniques to improve delivery of GI&S within Navy METOC product production centers and throughout the fleet user base. Continue TTS development and demonstration. Continue to develop METOC systems engineering plans, requirements, standards, studies, and other documentation supporting integration of these products.			
Title: Tactical Oceanography Capabilities / Undersea Warfare (USW)	0.312	0.312	0.352
Articles:	0	0	0

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 2012	FY 2013	FY 2014
FY 2012 Accomplishments: Continued to transition models, algorithms and databases that either calculate accurate acoustic transmission loss (TL) or characterize environmental parameters that affect TL and developed TL calculation implementations. Continued to develop capabilities to calculate acoustic transmission loss (TL) values in tactical timeframes to include uncertainty quantification of those values. The Navy has canceled all previously funded Ocean Bottom Characterization Initiative (OBCI) activities. ***FY 2013 Plans:*** Continue to transition models, algorithms and databases that either calculate accurate acoustic TL or characterize environmental parameters that affect TL and develop TL calculation implementations. Continue to develop capabilities to calculate acoustic TL values in tactical timeframes to include uncertainty quantification of those values. ***FY 2014 Plans:*** Continue to transition models, algorithms and databases that calculate accurate acoustic TL and characterize environmental parameters that affect TL. Develop TL calculation implementations to be used in the Navy's Anti-Submarine Warfare (ASW) Tactical Decision Aids (TDAs) and sonar trainers. Continue to develop capabilities to rapidly calculate acoustic TL values within tactical timeframes to include environmental uncertainty quantification of those values.			
Accomplishments/Planned Programs Subtotals	5.921	6.702	6.336

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	30.278	18.339	19.118		19.118	19.107	20.297	19.429	21.303	Continuing	Continuing
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	4.143	2.615	2.611		2.611	2.880	2.824	2.885	2.926	Continuing	Continuing
• RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD*	10.295	11.127	10.250		10.250	10.890	10.816	11.036	11.170	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC SENSOR ENGINEERING*	1.349	1.445	1.415		1.415	1.513	1.519	1.551	1.570	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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*

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 2014 Navy			DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	Naval Research Laboartory:Washington, DC	60.501	4.099	Oct 2011	4.790	Oct 2012	4.384	Oct 2013	-		4.384	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSC PAC:California	22.033	0.000		0.000		0.000		-		0.000	0.000	22.033	
METOC Future Mission Capabilities	Various	Various:Various	42.421	0.000		0.000		0.000		-		0.000	0.000	42.421	
LBS-G	C/CPIF	Teledyne Brown Eng:Alabama	6.557	0.000		0.000		0.000		-		0.000	0.000	6.557	
METOC Future Mission Capabilities	WR	NPGS:Monterey, CA	0.200	0.200	Oct 2011	0.200	Oct 2012	0.200	Oct 2013	-		0.200	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	Penn State University:PA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	NRL:Washington, DC	1.400	0.000		0.000		0.000		-		0.000	0.000	1.400	
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	Hydroid INC:Pocasset, MA	1.865	0.000		0.000		0.000		-		0.000	0.000	1.865	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	C/FP	Univ. of Texas:Texas	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	SSC PAC:California	2.754	0.000		0.000		0.000		-		0.000	0.000	2.754	
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	NSWC:Bethesda, MD	0.000	0.112	Dec 2011	0.120	Oct 2012	0.135	Oct 2013	-		0.135	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	C/FP	SAIC:Virginia	0.000	0.200	Mar 2012	0.192	Dec 2012	0.217	Dec 2013	-		0.217	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/FP	University of Washington:Seattle, WA	0.000	0.190	Apr 2012	0.250	Dec 2012	0.250	Dec 2013	-		0.250	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	Applied Science Associates (ASA):Rhode Island	0.600	0.570	May 2012	0.400	Dec 2012	0.400	Dec 2013	-		0.400	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC:Virginia	0.000	0.350	Dec 2011	0.500	Dec 2012	0.500	Dec 2013	-		0.500	Continuing	Continuing	Continuing
		Subtotal	139.931	5.721		6.452		6.086		0.000		6.086			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	Various:Various	2.672	0.000		0.000		0.000		-		0.000	0.000	2.672	
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC:Virginia	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	
		Subtotal	3.272	0.000		0.000		0.000		0.000		0.000	0.000	3.272	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	OPTEVFOR:Virginia	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	
METOC Future Mission Capabilities	MIPR	JITC:Arizona	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	
		Subtotal	0.200	0.000		0.000		0.000		0.000		0.000	0.000	0.200	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified:Not Specified	0.096	0.000		0.000		0.000		-		0.000	0.000	0.096	
METOC Future Mission Capabilities Management Support	C/FP	BAH:Virginia	0.200	0.200	Nov 2011	0.250	Nov 2012	0.250	Nov 2013	-		0.250	Continuing	Continuing	Continuing
		Subtotal	0.296	0.200		0.250		0.250		0.000		0.250			

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	143.699	5.921		6.702		6.336		0.000		6.336			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*

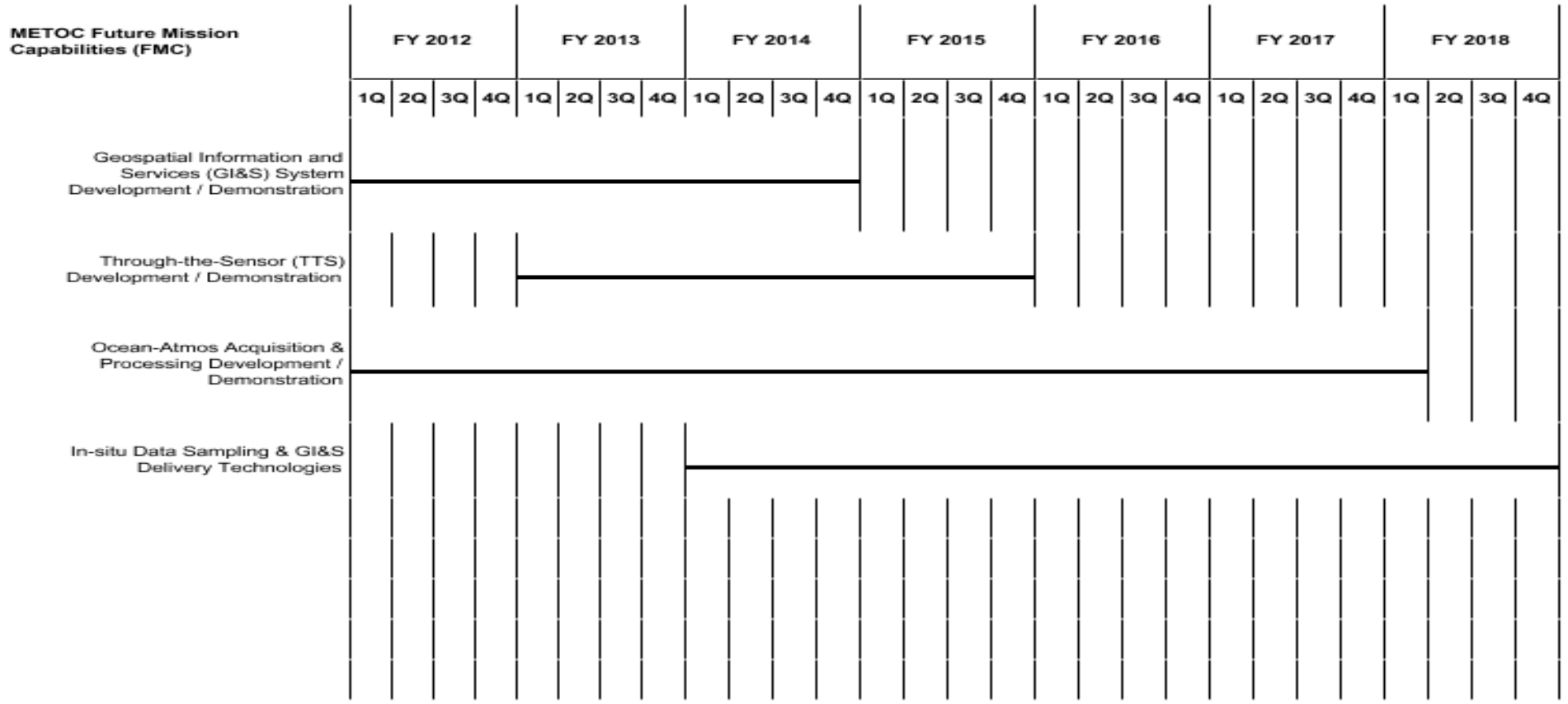

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2341: *METOC Data Acquisition*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
METOC Future Mission Capabilities (FMC)				
Geospatial Information and Services (GI&S) System Development / Demonstration:	1	2012	4	2014
Through-the-Sensor (TTS) Development / Demonstration: FY13-15	1	2013	4	2015
Ocean-Atmos Acquisition & Processing Development / Demonstration: Schedule Detail	1	2012	1	2018
In-situ Data Sampling & GI&S Delivery Technologies: Schedule Detail	1	2014	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2342.: *METOC Data Assimilation and Mod*	164.133	10.295	14.127	15.235	-	15.235	18.646	19.072	21.637	21.961	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

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 software associated with atmospheric and oceanographic data assimilation forecast models and database management systems 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 software models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) software 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 payload sensor data from 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). This software allows 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 software 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 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.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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*

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

FY 2014 request provides for continued advanced software 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 software), the continued development of advanced oceanographic and atmospheric prediction systems software 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 software technologies for tactical radars, remote sensing and undersea sensor systems.
The Earth System Prediction Capability (ESPC) program provides a more accurate global ocean and atmospheric forecast system with longer skillful forecast times through integrating and coupling atmosphere, ocean, ice, land and near-space forecast models into a seamless prediction system that reduces errors in the current modeling suite. Additionally it will develop a National common modeling architecture to improve cross-Agency collaboration, and a greatly more efficient computational architecture to allow for real-time operational prediction.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	4.558	4.795	4.199
Articles:	0	0	0

FY 2012 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 of prediction processes. Continued to develop data assimilation and fusion techniques and technologies for tactical sensors, remote sensing and undersea sensor systems. Continued to develop METOC and Geospatial Information & Services (GI&S) fusion algorithms and demonstrate reach-back fusion capability.

FY 2013 Plans:
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 using data from tactical sensors, remote sensing and undersea sensor systems. Continue to develop METOC and GI&S fusion algorithms and demonstrate reach-back capability.

FY 2014 Plans:
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 and assimilation techniques, data quality control technologies and accelerate the automation of prediction processes using data from tactical sensors, remote

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
sensing and undersea sensor systems. Continue to develop METOC and GI&S fusion algorithms and demonstrate reach-back capability.			
Title: Meteorological and Oceanographic (METOC) Space-Based Sensing Capabilities	2.787	3.264	2.170
Articles:	0	0	0
FY 2012 Accomplishments: Continued 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. Continued development of techniques for the assimilation of data from current and future civil, military and international earth observing systems. Conducted research and development of data processing techniques, data assimilation processes and advanced modeling methodologies utilizing satellite sensor data to generate Meteorological & Oceanography (METOC) products. Utilized data from follow-on DoD Satellites to develop METOC products.			
FY 2013 Plans: Continue research and development of data processing and data assimilation algorithms utilizing National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP), Meteorological Operational satellite program (MetOp), and Defense Meteorological Satellite Program (DMSP) satellite data. Begin assimilation of Meteorological satellite data from other Federal non-DOD, commercial, and foreign earth observing satellite systems. Prepare to ingest data from Joint Polar Satellite System (JPSS) and Defense Weather Satellite System (DWSS) program satellites.			
FY 2014 Plans: Continue research and development of data processing and data assimilation algorithms utilizing NPP, MetOp, and DMSP satellite data. Continue assimilation of Meteorological satellite data from other Federal non-DOD, commercial, and foreign earth observing satellite systems. Continue preparation to ingest data from JPSS program satellites. Begin research and development of data processing and data assimilation algorithms for the Geostationary Operational Environmental Satellite (GOES) program.			
Title: Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)	2.950	3.068	3.881
Articles:	0	0	0
FY 2012 Accomplishments: Continued 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. Continued 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) in Anti-Submarine Warfare (ASW). Continued population/upgrade of oceanographic, acoustic and geoacoustic databases in Combatant Commanders' (COCOM) areas of interest. Transitioned algorithms that capture and			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
communicate variability and uncertainty contained in the output of underlying model and data base components of ASW Tactical Decision Aids (TDAs). Expanded capabilities and increased access speed of acoustic surface scattering and loss modules. Populated/upgraded oceanographic and acoustic databases in COCOM areas of interest. Continued development of an ASW Reachback Cell (RBC) ocean model assessment toolkit. Developed methodologies that characterize and forecast bioacoustic volume attenuation and scatter functions as observed by the Navy's active hull-mounted sonar systems. Developed and transition the environmental components of Mine Warfare (MIW) TDAs in use by the U.S. Navy's MIW Forces and Naval Oceanography enterprise (NOe) personnel supporting them. Documented autonomous underwater vehicle (AUV) technology demonstrations that measure in-situ geoacoustic data. Delivered a prototype bottom backscatter database to the Naval Oceanographic Office (NAVOCEANO). Provided technical support to NAVOCEANO in updating bottom loss data bases for sonar performance predictions.			
FY 2013 Plans: Continue decision tool development that assist Undersea Warfare (USW) warfighters to optimally deploy assets equipped with 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 COAs in ASW. Continue population/upgrade of oceanographic, acoustic and geoacoustic databases in Combatant Commanders' (COCOM) 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 Tactical Decision Aids (TDAs). Expand capabilities and increase access speed of acoustic surface scattering and loss modules. Continue development of an Anti-Submarine Warfare (ASW) Reachback Cell (RBC) ocean model assessment toolkit. Continue development of methodologies that characterize and forecast bioacoustic volume attenuation and scatter functions as observed by the Navy's active hull-mounted sonar systems. Continue to develop and transition the environmental components of Mine Warfare (MIW) TDAs in use by the U.S. Navy's MIW Forces and Naval Oceanography enterprise (NOe) personnel supporting them.			
FY 2014 Plans: Continue to develop the underlying acoustic and environmental software components of Navy decision tools that assist USW warfighters to optimally deploy assets equipped with acoustic sensors and to take advantage of prevailing environmental conditions. Verify, validate and transition this software technology through the Oceanographic and Atmospheric Master Library (OAML). Continue to refine and validate USW-related performance surface and decision support software applications for use afloat and at ASW RBCs to determine appropriate tactical COAs in ASW. Continue population/upgrade of oceanographic, acoustic and geoacoustic databases in COCOM areas of interest. Transition software 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. Continue development of an ASW RBC ocean software model assessment toolkit. Continue development of software-based methodologies that characterize and forecast bioacoustic volume attenuation and scatter functions as observed by the Navy's active hull-mounted sonar systems. Continue to develop and			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
transition the environmental software components of MIW TDAs in use by the U.S. Navy's MIW Forces and Naval NOe personnel supporting them. Provide technical support to the Naval Oceanographic Office (NAVOCEANO) in updating geoacoustic bottom loss & scatter, as well as acoustic clutter data bases for sonar performance predictions. Begin to design, develop, demonstrate and transition a geospatially-enabled global ocean observing system database through the Ocean Observing System Security Group (OOSSG) designed to characterize national and international ocean observatories locations, sensor grid capabilities and mitigations to address potential U.S. submarine security vulnerabilities.			
Title: Earth System Prediction Capability (ESPC) ***Articles:*** ***FY 2013 Plans:*** The Earth System Prediction Capability (ESPC) program provides a more accurate global ocean and atmospheric forecast system with common modeling architecture to improve cross-Agency collaboration, and a greatly more efficient computational architecture to allow for real-time operational prediction. In 2013, a common model architecture and standards will be initiated, demonstration plans will be developed, and science workshops and early benchmark testing will be conducted. Long range program goal is advanced skillful forecast (relative to averaged climatology) from the operational capability, currently 7-10 days, to 30 days and longer. Provides the Navy component to match a National R&D initiative across the major U.S. National Operational Prediction Centers at Navy, NOAA, and DOE. ***FY 2014 Plans:*** -Continue all efforts from FY2013. -Continue to develop a National common environmental computing architecture to improve cross-Agency collaboration, and a greatly more efficient computational architecture to allow for real-time operational prediction. -Continue common environmental model architecture and standards, and prediction demonstration plans and science workshops, and initiate benchmark testing. -Continue efforts towards advanced skillful environmental forecasts and decision guidance (relative to averaged climatology) to improve from the operational capability, currently 7-10 days, to 30 days and longer. -Continue the Navy component to the National R&D initiative for Environmental Prediction across the major U.S. National Operational Prediction Centers at Navy, NOAA, NASA, and DOE.	0.000 0	3.000 0	4.985 0
Accomplishments/Planned Programs Subtotals	10.295	14.127	15.235

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• OPN/4226: *METEOROLOGICAL EQUIPMENT*	30.278	18.339	19.118		19.118	19.107	20.297	19.429	21.303	Continuing	Continuing
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	4.143	2.615	2.611		2.611	2.880	2.824	2.885	2.926	Continuing	Continuing
• RDTEN/0603207N/2341: *METOC DATA ACQUISITION*	5.921	6.702	6.336		6.336	6.909	6.838	6.990	7.087	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC SENSOR ENGINEERING*	1.349	1.445	1.415		1.415	1.513	1.519	1.551	1.570	Continuing	Continuing
• RDTEN/0305160N/0524: *NAVY METOC SUPPORT (SPACE)*	0.820	0.810	0.742		0.742	0.885	0.890	0.902	0.919	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition, management and contracting strategies to support the Meteorological & Oceanography (METOC) Data Assimilation Project which is a multi-faceted program which includes: 1) development, demonstration and validation of software associate with atmospheric and oceanographic data assimilation forecast models and database management systems for use in both mainframe and tactical scale computers; 2) other software models, which focus on ocean thermal structure and circulation, and surf and tide prediction; 3) software 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.

Acquisition, management and contracting strategies to support the Earth System Prediction Capability Project, a multi-faceted program which includes: 1) development, demonstration and validation of atmospheric, sea ice and oceanographic data assimilation techniques, forecast models, database management systems, and associated software for use in teraflop to petaflop scale computers; 2) other models, which focus on decision products and quantifying thresholds, forecast uncertainty, and risk for Navy and DoD resource and mission planning using non-Navy models as input; 3) techniques to improve computational and data dissemination efficiency for environmental information dominance.

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 software 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-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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Goal (ESPC): Develop a more accurate global ocean, atmosphere, wave and sea ice forecast system with longer skillful forecast times from weeks to seasons through integrating and coupling atmosphere, ocean, ice, land and near-space forecast models into a seamless prediction system that reduces errors in the current modeling suite. Additionally develop a common modeling architecture to improve cross-Agency collaboration, and a greatly more efficient computational architecture to allow for real-time operational prediction.

Metrics: Long term trends show a globally averaged gain of skill of 1 day per decade of RDT&E investment, i.e. today's 5-day forecast is as accurate as the 3-day forecast available in the early 1990's. This program will implement new technological approaches to improve 7-14 day predictions to the level of current 5-7 day forecasts and will seek to provide quantifiable skill above long term seasonal averages for 14-90 day lead times for mission planning.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL:Washington DC	108.619	3.518	Oct 2011	4.055	Oct 2012	3.524	Oct 2013	-		3.524	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSCs:California, South Carolina	2.272	0.000		0.000		0.000		-		0.000	0.000	2.272	
METOC Future Mission Capabilities	Various	Various:Various	41.183	0.000		0.000		0.000		-		0.000	0.000	41.183	
METOC Future Mission Capabilities	C/FP	Univ. S. Miss.:Mississippi	2.413	0.000		0.000		0.000		-		0.000	0.000	2.413	
METOC Space-Based Sensing Capabilities	WR	NRL:Washington, DC	4.608	2.487	Oct 2011	2.939	Oct 2012	1.955	Oct 2013	-		1.955	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NRL:Washington, DC	2.130	1.651	Oct 2011	1.491	Oct 2012	1.861	Oct 2013	-		1.861	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Texas:TX	0.700	0.100	Mar 2012	0.120	Dec 2012	0.160	Dec 2013	-		0.160	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NSWC Carderock:West Bethesda, MD	0.450	0.000		0.000		0.000		-		0.000	0.000	0.450	
Tactical Oceanography Capabilities / Undersea Warfare	WR	NAVOCEANO:Mississippi	0.300	0.249	Oct 2011	0.245	Oct 2012	0.325	Oct 2013	-		0.325	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Washington:Seattle, WA	0.000	0.320	Mar 2012	0.115	Dec 2012	0.153	Dec 2013	-		0.153	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Johns Hopkins University:MD	0.000	0.050	Mar 2012	0.100	Dec 2012	0.130	Dec 2013	-		0.130	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SAIC:Virginia	0.000	0.600	Nov 2011	0.727	Nov 2012	0.967	Nov 2013	-		0.967	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC:Virginia	0.000	0.400	Dec 2011	0.440	Dec 2012	0.400	Dec 2013	-		0.400	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/FP	Johns Hopkins University:MD	0.000	0.200	Dec 2011	0.200	Dec 2012	0.175	Dec 2013	-		0.175	Continuing	Continuing	Continuing
Earth Systems Prediction Capability (ONR)	WR	NRL:Washington DC	0.000	0.000		2.100	Oct 2012	3.835	Oct 2013	-		3.835	Continuing	Continuing	Continuing
ESPC	Various	Various:Various	0.000	0.000		0.900	Oct 2012	0.950	Oct 2013	-		0.950	Continuing	Continuing	Continuing
		Subtotal	162.675	9.575		13.432		14.435		0.000		14.435			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	SSA/CSC:MISC	0.295	0.000		0.000		0.000		-		0.000	0.000	0.295	
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC:Virginia	0.473	0.000		0.000		0.000		-		0.000	0.000	0.473	
METOC Future Mission Capabilities	C/FP	SAIC:Virginia	0.200	0.150	Nov 2011	0.100	Nov 2012	0.100	Nov 2013	-		0.100	Continuing	Continuing	Continuing
Program Support and Subject Matter Expertise	Various	UW-APL:Seattle, WA	0.000	0.000		0.000		0.200	Oct 2013	-		0.200	0.000	0.200	
		Subtotal	0.968	0.150		0.100		0.300		0.000		0.300			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified:Not Specified	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	
METOC Space-Based Sensing Capabilities	C/FP	BAH:Virginia	0.400	0.300	Nov 2011	0.325	Nov 2012	0.215	Nov 2013	-		0.215	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Oceanography Capabilities / Undersea Warfare	WR	SSC PAC:San Diego, CA	0.000	0.270	Oct 2011	0.270	Oct 2012	0.285	Oct 2013	-		0.285	Continuing	Continuing	Continuing
		Subtotal	0.490	0.570		0.595		0.500		0.000		0.500			

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	164.133	10.295		14.127		15.235		0.000		15.235			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*

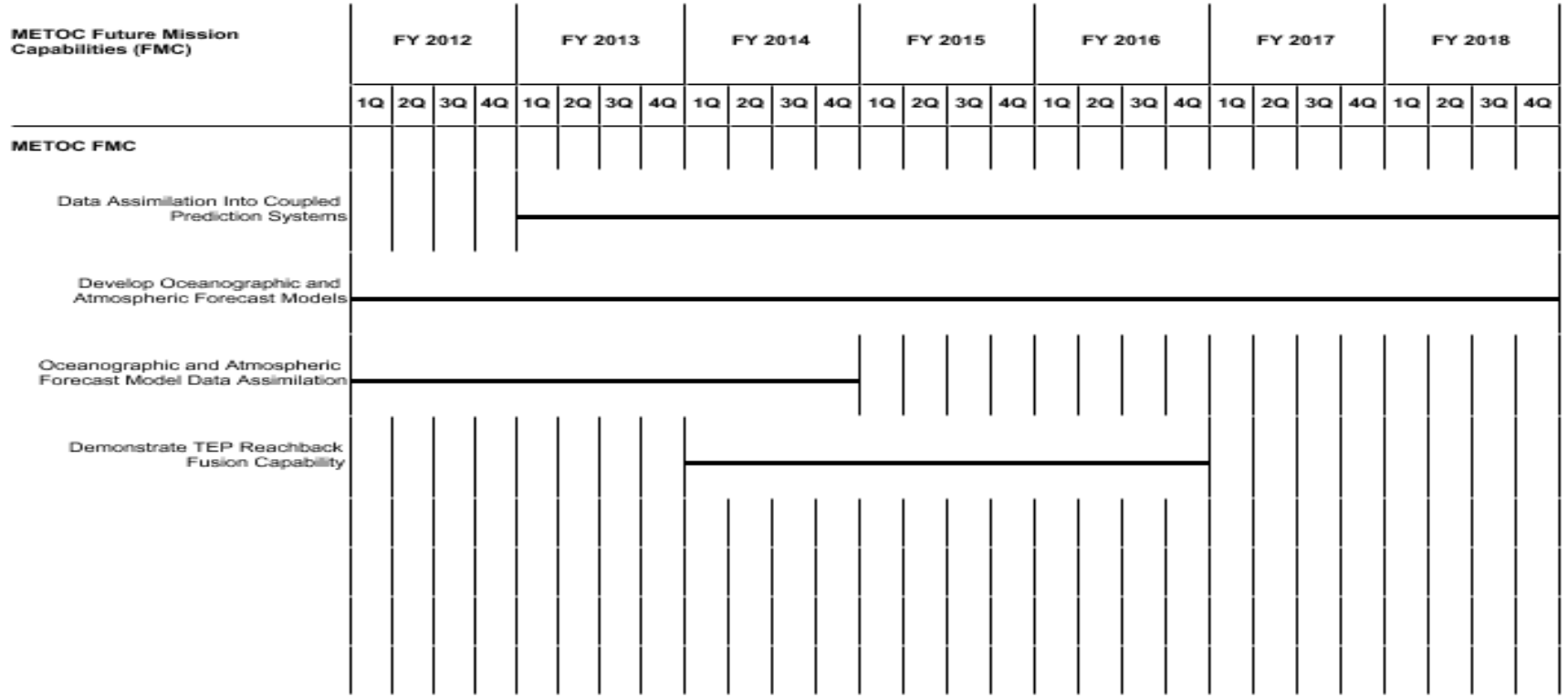

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342.: *METOC Data Assimilation and Mod*

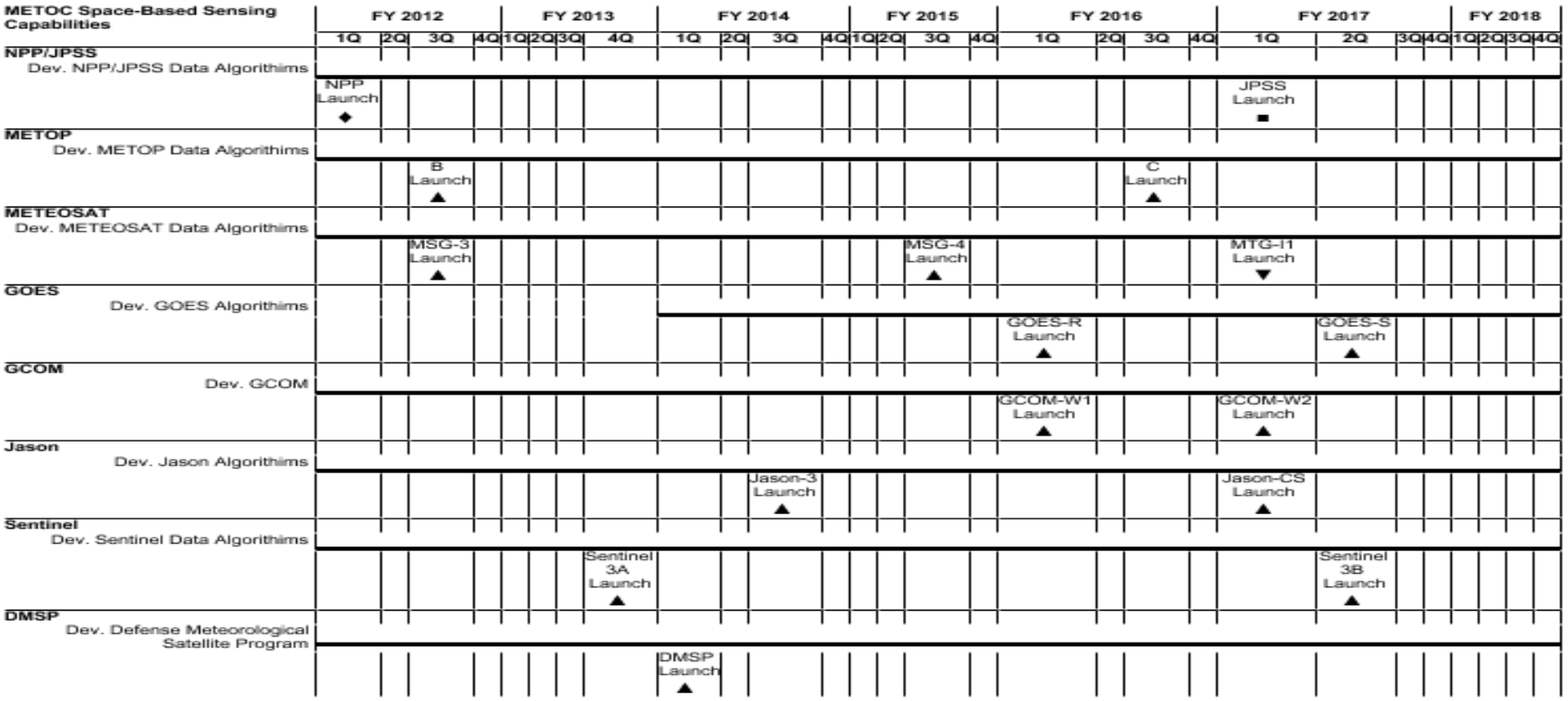

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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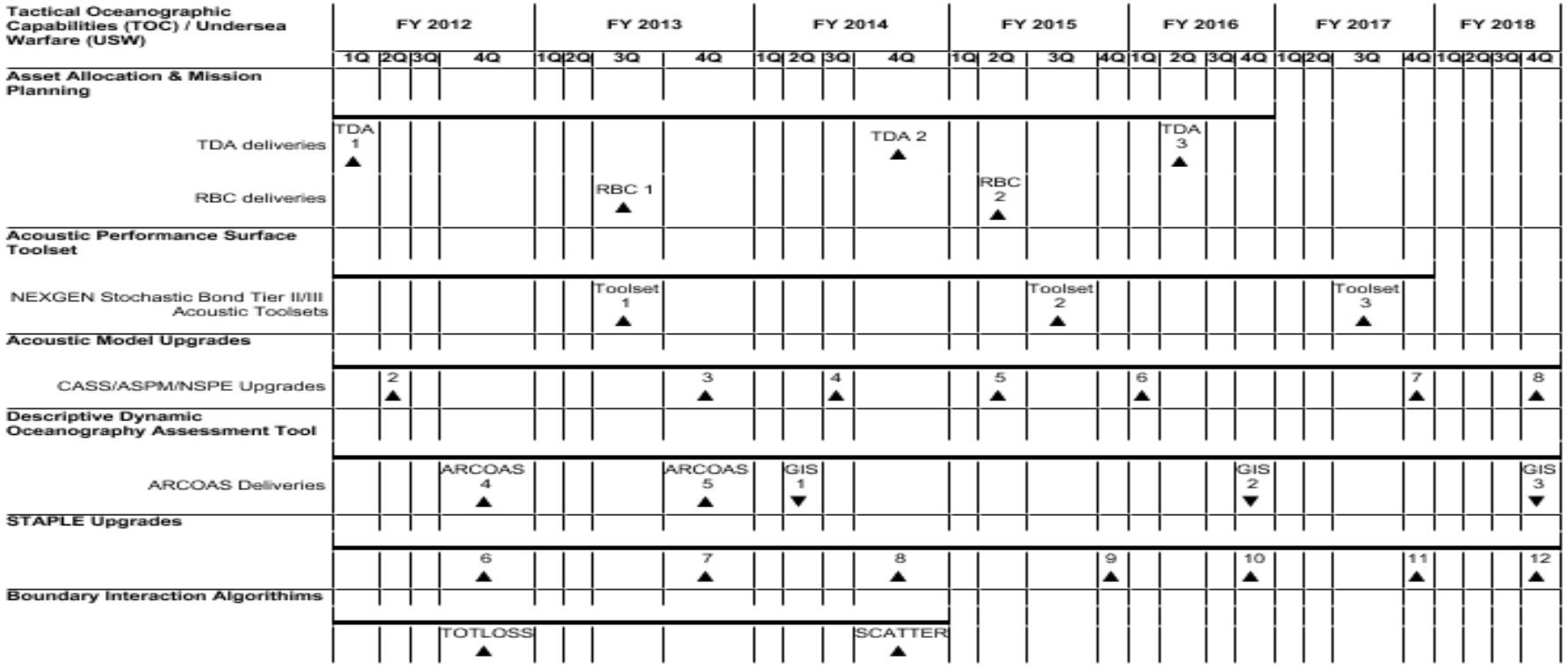

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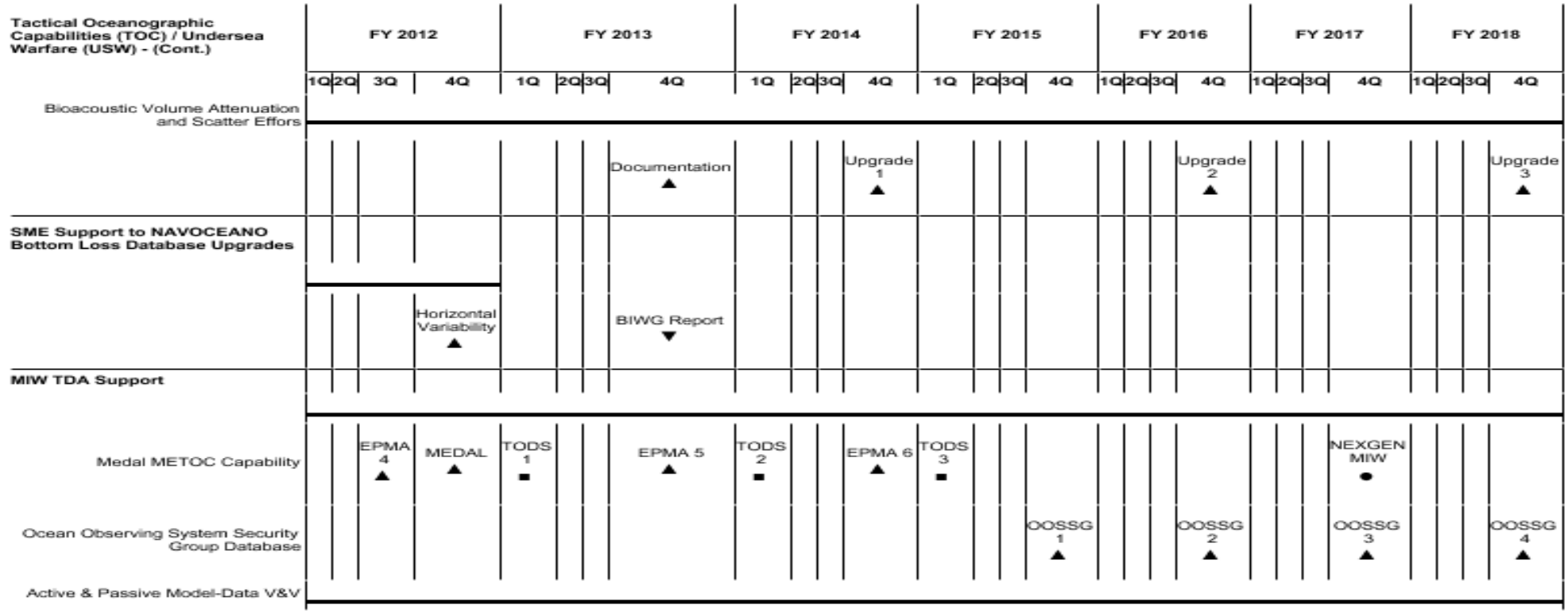
Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603207N: *Air/Ocean Tactical Applications*	PROJECT 2342.: *METOC Data Assimilation and Mod*



2014DON - 0603207N - 2342.L39

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*

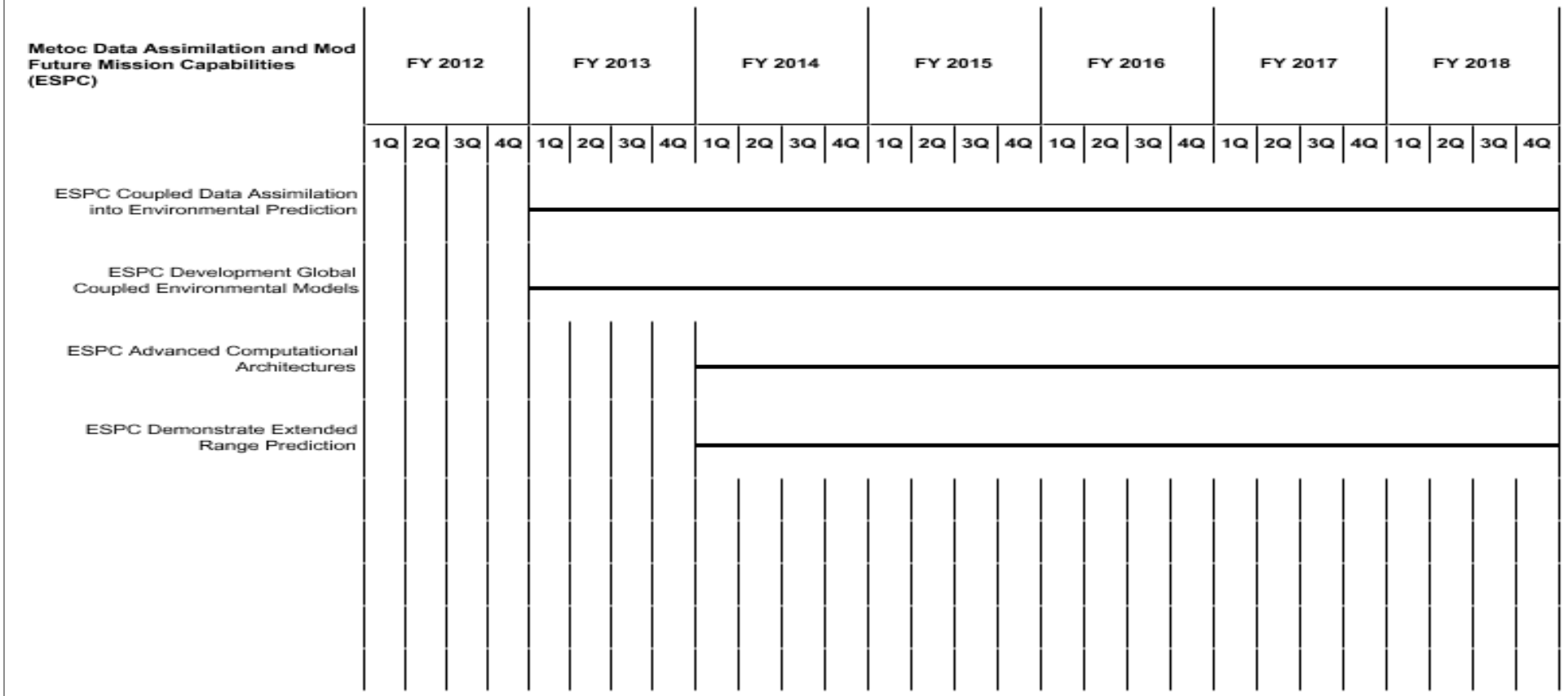


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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2342.: *METOC Data Assimilation and Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
METOC Future Mission Capabilities (FMC)				
METOC FMC: Data Assimilation Into Coupled Prediction Systems:	1	2013	4	2018
METOC FMC: Develop Oceanographic and Atmospheric Forecast Models:	1	2012	4	2018
METOC FMC: Oceanographic and Atmospheric Forecast Model Data Assimilation:	1	2012	4	2014
METOC FMC: Demonstrate TEP Reachback Fusion Capability:	1	2014	4	2016
METOC Space-Based Sensing Capabilities				
NPP/JPSS: Dev. NPP/JPSS Data Algorithims:	1	2012	4	2018
NPP/JPSS: Dev. NPP/JPSS Data Algorithims: NPP Launch	1	2012	1	2012
NPP/JPSS: Dev. NPP/JPSS Data Algorithims: JPSS-1 Launch	1	2017	1	2017
METOP: Dev. METOP Data Algorithims:	1	2012	4	2018
METOP: Dev. METOP Data Algorithims: METOP-B Launch	3	2012	3	2012
METOP: Dev. METOP Data Algorithims: METOP-C Launch	3	2016	3	2016
METEOSAT: Dev. METEOSAT Data Algorithims:	1	2012	4	2018
METEOSAT: Dev. METEOSAT Data Algorithims: MSG-3 Launch	3	2012	3	2012
METEOSAT: Dev. METEOSAT Data Algorithims: MSG-4 Launch	3	2015	3	2015
METEOSAT: Dev. METEOSAT Data Algorithims: MTG-I1 Launch	1	2017	1	2017
GOES: Dev. GOES Algorithims:	1	2014	4	2018
GOES: Dev. GOES Algorithims: GOES-R Launch	1	2016	1	2016
GOES: Dev. GOES Algorithims: GOES-S Launch	2	2017	2	2017
GCOM: Dev. GCOM:	1	2012	4	2018
GCOM: Dev. GCOM: GCOM-W1 Launch	1	2016	1	2016
GCOM: Dev. GCOM: GCOM-W2 Launch	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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**
Jason: Dev. Jason Algorithims:	1	2012	4	2018
Jason: Dev. Jason Algorithims: Jason-3 Launch	3	2014	3	2014
Jason: Dev. Jason Algorithims: Jason-CS Launch	1	2017	1	2017
Sentinel: Dev. Sentinel Data Algorithims:	1	2012	4	2018
Sentinel: Dev. Sentinel Data Algorithims: Sentinel 3A Launch	4	2013	4	2013
Sentinel: Dev. Sentinel Data Algorithims: Sentinel 3B Launch	2	2017	2	2017
DMSP: Dev. Defense Meteorological Satellite Program:	1	2012	4	2018
DMSP: Dev. Defense Meteorological Satellite Program: DMSP-19 Launch	1	2014	1	2014
Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW)				
Asset Allocation & Mission Planning:	1	2012	4	2016
Asset Allocation & Mission Planning: TDA deliveries: ASW TDA Delivery 1	1	2012	1	2012
Asset Allocation & Mission Planning: TDA deliveries: ASW TDA Delivery 2	4	2014	4	2014
Asset Allocation & Mission Planning: TDA deliveries: ASW TDA Delivery 3	2	2016	2	2016
Asset Allocation & Mission Planning: RBC deliveries: ASW RBC Delivery 1	3	2013	3	2013
Asset Allocation & Mission Planning: RBC deliveries: ASW RBC Delivery 2	2	2015	2	2015
Acoustic Performance Surface Toolset:	1	2012	4	2017
Acoustic Performance Surface Toolset: NEXGEN Stochastic Bond Tier II/III Acoustic Toolsets: NEXGEN Stochastic Bond Tier II/III Acoustic Toolset 1	3	2013	3	2013
Acoustic Performance Surface Toolset: NEXGEN Stochastic Bond Tier II/III Acoustic Toolsets: NEXGEN Stochastic Bond Tier II/III Acoustic Toolset 2	3	2015	3	2015
Acoustic Performance Surface Toolset: NEXGEN Stochastic Bond Tier II/III Acoustic Toolsets: NEXGEN Stochastic Bond Tier II/III Acoustic Toolset 3	3	2017	3	2017
Acoustic Model Upgrades: Schedule Detail	1	2012	4	2018
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 2	2	2012	2	2012
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 3	4	2013	4	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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**
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 4	3	2014	3	2014
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 5	2	2015	2	2015
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 6	1	2016	1	2016
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 7	4	2017	4	2017
Acoustic Model Upgrades: CASS/ASPM/NSPE Upgrades: CASS/ASPM/NSPE Upgrade 8	4	2018	4	2018
Descriptive Dynamic Oceanography Assessment Tool: Schedule Detail	1	2012	4	2018
Descriptive Dynamic Oceanography Assessment Tool: ARCOAS Deliveries: ARCOAS Delivery 4	4	2012	4	2012
Descriptive Dynamic Oceanography Assessment Tool: ARCOAS Deliveries: ARCOAS Delivery 5	4	2013	4	2013
Descriptive Dynamic Oceanography Assessment Tool: ARCOAS Deliveries: NEXGEN ASW RBC GIS Toolset 1	2	2014	2	2014
Descriptive Dynamic Oceanography Assessment Tool: ARCOAS Deliveries: NEXGEN ASW RBC GIS Toolset 2	4	2016	4	2016
Descriptive Dynamic Oceanography Assessment Tool: ARCOAS Deliveries: NEXGEN ASW RBC GIS Toolset 3	4	2018	4	2018
STAPLE Upgrades:	1	2012	4	2018
STAPLE Upgrades: STAPLE Delivery 6	4	2012	4	2012
STAPLE Upgrades: STAPLE Delivery 7	4	2013	4	2013
STAPLE Upgrades: STAPLE Delivery 8	4	2014	4	2014
STAPLE Upgrades: STAPLE Delivery 9	4	2015	4	2015
STAPLE Upgrades: STAPLE Delivery 10	4	2016	4	2016
STAPLE Upgrades: STAPLE Delivery 11	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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**
STAPLE Upgrades: STAPLE Delivery 12	4	2018	4	2018
Boundary Interaction Algorithims:	1	2012	4	2014
Boundary Interaction Algorithims: TOTLOSS Algorithm	4	2012	4	2012
Boundary Interaction Algorithims: TOTLOSS/SCATTER Algorithm Delivery	4	2014	4	2014
Tactical Oceanographic Capabilities (TOC) / Undersea Warfare (USW) - (Cont.)				
Bioacoustic Volume Attenuation and Scatter Effors:	1	2012	4	2018
Bioacoustic Volume Attenuation and Scatter Effors: Documentation Delivery	4	2013	4	2013
Bioacoustic Volume Attenuation and Scatter Effors: VSS Database Upgrade 1	4	2014	4	2014
Bioacoustic Volume Attenuation and Scatter Effors: VSS Database Upgrade 2	4	2016	4	2016
Bioacoustic Volume Attenuation and Scatter Effors: VSS Database Upgrade 3	4	2018	4	2018
SME Support to NAVOCEANO Bottom Loss Database Upgrades:	1	2012	4	2012
SME Support to NAVOCEANO Bottom Loss Database Upgrades: HFBL Horizontal Variability	4	2012	4	2012
SME Support to NAVOCEANO Bottom Loss Database Upgrades: Bottom Interaction Working Group Report	4	2013	4	2013
MIW TDA Support: Schedule Detail	1	2012	4	2018
MIW TDA Support: Medal METOC Capability: MEDAL METOC Capability	4	2012	4	2012
MIW TDA Support: Medal METOC Capability: EPMA Build 4	3	2012	3	2012
MIW TDA Support: Medal METOC Capability: EPMA Build 5	4	2013	4	2013
MIW TDA Support: Medal METOC Capability: EPMA Build 6	4	2014	4	2014
MIW TDA Support: Medal METOC Capability: TODS Components 1	1	2013	1	2013
MIW TDA Support: Medal METOC Capability: TODS Components 2	1	2014	1	2014
MIW TDA Support: Medal METOC Capability: TODS Components 3	1	2015	1	2015
MIW TDA Support: Medal METOC Capability: NEXGEN MIW Environmental Application	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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**
MIW TDA Support: Ocean Observing System Security Group Database: OOSSG Database Delivery #1	4	2015	4	2015
MIW TDA Support: Ocean Observing System Security Group Database: OOSSG Database Delivery #2	4	2016	4	2016
MIW TDA Support: Ocean Observing System Security Group Database: OOSSG Database Delivery #3	4	2017	4	2017
MIW TDA Support: Ocean Observing System Security Group Database: OOSSG Database Delivery #4	4	2018	4	2018
MIW TDA Support: Active & Passive Model-Data V&V: Schedule Detail	1	2012	4	2018
Metoc Data Assimilation and Mod Future Mission Capabilities (ESPC)				
ESPC Coupled Data Assimilation into Environmental Prediction:	1	2013	4	2018
ESPC Development Global Coupled Environmental Models:	1	2013	4	2018
ESPC Advanced Computational Architectures:	1	2014	4	2018
ESPC Demonstrate Extended Range Prediction:	1	2014	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2343: *Tactical METOC Applications*	108.168	9.323	9.172	8.908	-	8.908	11.195	15.690	15.500	16.529	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

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 2014 request provides for the continuation of NITES-Next Release 2 software development efforts including extensive system architecture, and testing efforts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	9.323	9.172	8.908

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 2012	FY 2013	FY 2014
Articles:	0	0	0
FY 2012 Accomplishments: NITES-Next was designated as an IT Streamline "Pilot" by the Milestone Decision Authority (MDA) on 5 March 2012. NITES-Next was directed by the MDA to develop a new acquisition strategy as an IT Pilot and report back for a Build Decision (BD). Conducted a NITES-Next Fleet Capability Release-1 (FCR-1) Design Review (DR). Completed the design and documentation of NITES-Next FCR-1, including the software architecture design; and began the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) Fleet Capability Release-1 (FCR-1) software development. Began preparation for all Consolidated Afloat Networks and Enterprise Services (CANES) System Integration Test (SIT), Test Readiness Reviews (TRR), and Developmental Test and Evaluation (DT&E) efforts scheduled for FY 2013. Awarded the NITES-Next FCR-1 development contract task order.			
FY 2013 Plans: Continue developing FCR-1 software. Obtain Limited Deployment Decision (LDD) for FCR-1. Coordinate with Naval Command Operational Test and Evaluation Force (COMOPTEVFOR) for test events. Conduct FCR-1 System Integration Test #1 (SIT). Obtain interim authority to operate (IATO) for live network testing. Obtain authority to operate (ATO) for FCR-1. Begin and complete the planning and documentation (including Requirements Definition Package (RDP), Cost Analysis Requirements Description (CARD) and Acquisition Program Baseline (APB)) for NITES-Next FCR-2. Conduct System Engineering Technical Review (SETR) Build Decision Review (BDR) for FCR-2. Update Technology Readiness Assessment (TRA) for FCR-1 and FCR-2. Obtain FCR-2 Build Decision. Generate FCR-2 task order and contract package.			
FY 2014 Plans: Conduct SIT #2, System Qualification Test (SQT), DT&E, Operational Assessment (OA), and Operational Test (OT) for FCR-1. Coordinate with COMOPTEVFOR and complete OA report in support of FCR-1 LDD. Complete Navy Training System Plan (NTSP), Independent Logistics Assessment (ILA) for FCR-1. Plan the FCR-2 test activities. Award task order and start development and coding of FCR-2. Begin documentation and preparation (including RDP, CARD and APB) for FCR-3.			
Accomplishments/Planned Programs Subtotals	9.323	9.172	8.908

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support the Tactical Meteorological & Oceanographic (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

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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*

open ocean and littoral operating environments, meteorology and oceanography , all with management oversight incorporating these into the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program under Joint Capabilities Integration and Development System (JCIDS) by the Department of the Navy (DoN).

E. Performance Metrics

Goal: Develop 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 2014 Navy		DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NITES/NITES-Next	WR	NRL:Washington, DC	3.893	0.000		0.000		0.000		-		0.000	0.000	3.893	
NITES/NITES-Next	WR	SSCs:California, South Carolina	8.673	0.000		0.000		0.000		-		0.000	0.000	8.673	
NITES/NITES-Next	Various	Various:Various	5.775	0.000		0.000		0.000		-		0.000	0.000	5.775	
NITES	Various	Various:Various	61.400	0.000		0.000		0.000		-		0.000	0.000	61.400	
NITES-Next	C/CPIF	GD-IT:Virginia	25.551	0.000		0.000		0.000		-		0.000	0.000	25.551	
NITES-Next	WR	NAVOCEANO:Mississippi	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	
NITES-Next	WR	SSC Pacific:San Diego, CA	0.000	4.168	Oct 2011	3.850	Oct 2012	3.837	Oct 2013	-		3.837	Continuing	Continuing	Continuing
NITES-Next	C/FP	SAIC:Virginia	0.000	0.980	Nov 2011	1.600	Nov 2012	1.406	Nov 2013	-		1.406	Continuing	Continuing	Continuing
NITES-Next	C/FP	FSI:San Diego, CA	0.000	3.100	Jun 2012	2.500	Nov 2012	2.420	Nov 2013	-		2.420	Continuing	Continuing	Continuing
NITES-Next	WR	SSC Atlantic:South Carolina	0.000	0.200	Jun 2012	0.347	Mar 2013	0.335	Mar 2014	-		0.335	Continuing	Continuing	Continuing
		Subtotal	105.417	8.448		8.297		7.998		0.000		7.998			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Cost	C/CPIF	IPD:Various	0.595	0.000		0.000		0.000		-		0.000	0.000	0.595	
NITES-Next	C/FP	SAIC:Virgina	1.600	0.475	Nov 2011	0.325	Nov 2012	0.335	Nov 2013	-		0.335	Continuing	Continuing	Continuing
NITES-Next	C/FP	NAVAIR:Maryland	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	
NITES-Next	C/FP	COMOPTEVFOR:Norfolk, VA	0.000	0.000		0.100	Nov 2012	0.100	Nov 2013	-		0.100	Continuing	Continuing	Continuing
		Subtotal	2.320	0.475		0.425		0.435		0.000		0.435			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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*	

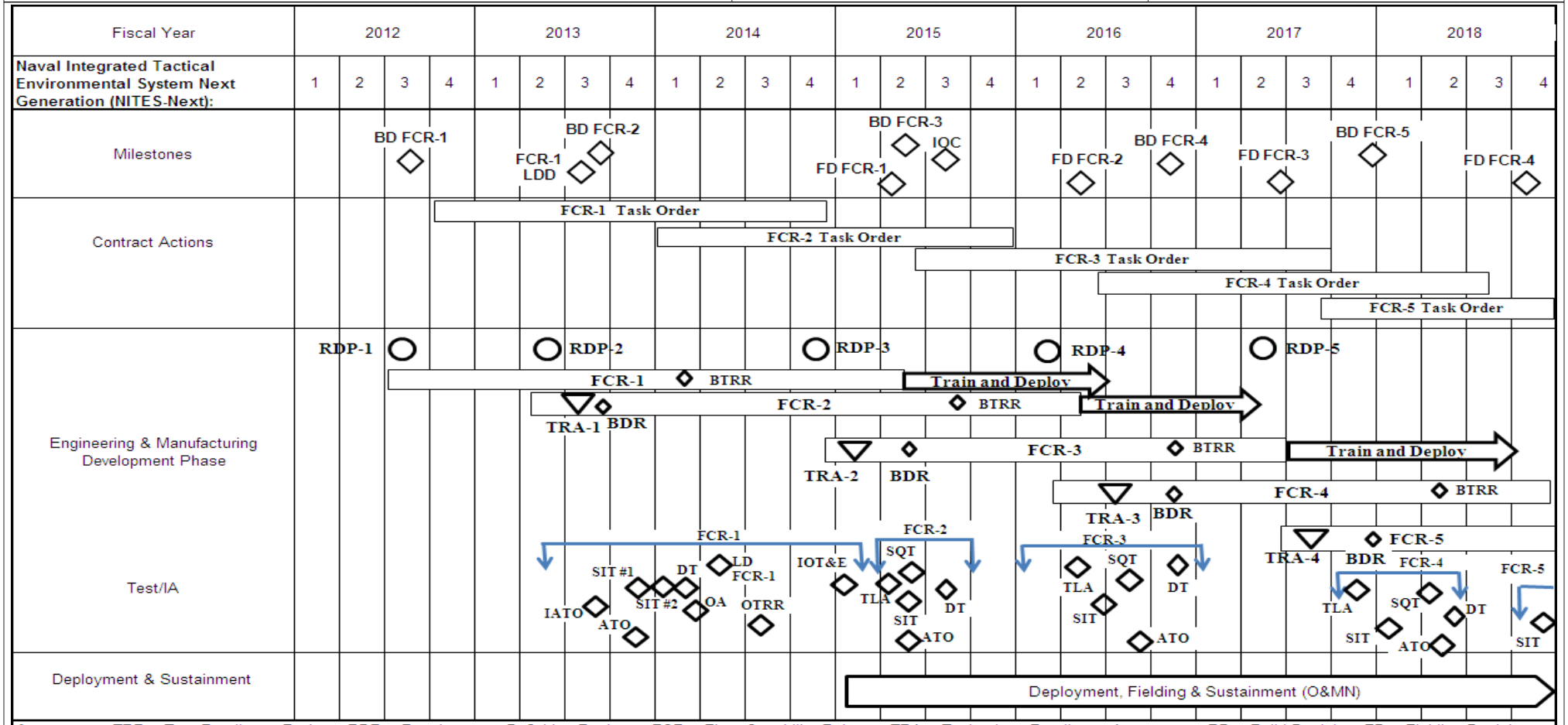
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various:Various	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	
NITES-Next	WR	SSC Pacific:San Diego, CA	0.000	0.100	Oct 2011	0.200	Oct 2012	0.225	Oct 2013	-		0.225	Continuing	Continuing	Continuing
NITES-Next	C/FP	BAH:Virgina	0.400	0.300	Nov 2011	0.250	Nov 2012	0.250	Nov 2013	-		0.250	Continuing	Continuing	Continuing
		Subtotal	0.431	0.400		0.450		0.475		0.000		0.475			

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	108.168	9.323		9.172		8.908		0.000		8.908			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*



Acronyms: TRR = Test Readiness Review. RDP = Requirements Definition Package FCR = Fleet Capability Release. TRA = Technology Readiness Assessment BD = Build Decision. FD = Fielding Decision. Limited Deployment Decision = LDD. IOC= Initial Operational Capability. IATO = Interim Authority to Operate. ATO = Authority to Operate. LD = Limited Deployment. OA = Operational Assessment. BDR = Build Decision Review. SIT = System Integration Test. SQT = System Qualification Test. TLA = Test Level Assessment. DT = Developmental Test

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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**
Naval Integrated Tactical Environmental System Next Generation (NITES-Next)				
Milestones: Build Decision Fleet Capability Release - 1	3	2012	3	2012
Milestones: Build Decision Fleet Capability Release - 2	3	2013	3	2013
Milestones: Initial Operational Capability	3	2015	3	2015
Milestones: Fielding Decision Fleet Capability Release - 1	2	2015	2	2015
Milestones: Build Decision Fleet Capability Release - 3	2	2015	2	2015
Milestones: Fielding Decision Fleet Capability Release - 2	2	2016	2	2016
Milestones: Build Decision Fleet Capability Release - 4	4	2016	4	2016
Milestones: Fielding Decision Fleet Capability Release - 3	2	2017	2	2017
Milestones: Build Decision Fleet Capability Release - 5	4	2017	4	2017
Milestones: Fielding Decision Fleet Capability Release - 4	4	2018	4	2018
Milestones: Limited Deployment Decision Fleet Capability Release - 1	3	2013	3	2013
Contract Actions: FCR-1 Task Order	4	2012	4	2014
Contract Actions: FCR-2 Task Order	1	2014	4	2015
Contract Actions: FCR-3 Task Order	2	2015	3	2017
Contract Actions: FCR-4 Task Order	2	2016	3	2018
Contract Actions: FCR-5 Task Order	3	2017	4	2018
Engineering & Manufacturing Development Phase: Requirements Definition Package - 1	3	2012	3	2012
Engineering & Manufacturing Development Phase: Requirements Definition Package - 2	2	2013	2	2013
Engineering & Manufacturing Development Phase: Requirements Definition Package - 3	4	2014	4	2014

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Engineering & Manufacturing Development Phase: Requirements Definition Package - 4	1	2016	1	2016
Engineering & Manufacturing Development Phase: Requirements Definition Package - 5	2	2017	2	2017
Engineering & Manufacturing Development Phase: Build Design Review FCR-2	3	2013	3	2013
Engineering & Manufacturing Development Phase: Build Design Review FCR-3	2	2015	2	2015
Engineering & Manufacturing Development Phase: Build Design Review FCR-4	4	2016	4	2016
Engineering & Manufacturing Development Phase: Build Design Review FCR-5	4	2017	4	2017
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 1	3	2013	3	2013
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 2	1	2015	1	2015
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 3	3	2016	3	2016
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 4	3	2017	3	2017
Engineering & Manufacturing Development Phase: Build Test Readiness Review FCR-1	1	2014	1	2014
Engineering & Manufacturing Development Phase: Build Test Readiness Review FCR-2	3	2015	3	2015
Engineering & Manufacturing Development Phase: Build Test Readiness Review FCR-3	4	2016	4	2016
Engineering & Manufacturing Development Phase: Build Test Readiness Review FCR-4	2	2018	2	2018
Test/IA: Fleet Capability Release - 1	2	2013	1	2015
Test/IA: Fleet Capability Release - 2	1	2015	4	2015
Test/IA: Fleet Capability Release - 3	1	2016	1	2017
Test/IA: Fleet Capability Release - 4	4	2017	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test/IA: System Integration Test - 1 (FCR-1)	4	2013	4	2013
Test/IA: System Integration Test - 2 (FCR-1)	1	2014	1	2014
Test/IA: System Integration Test - 3 (FCR-2)	2	2015	2	2015
Test/IA: System Integration Test - 4 (FCR-3)	2	2016	2	2016
Test/IA: System Integration Test - 5 (FCR-4)	1	2018	1	2018
Test/IA: System Integration Test - 6 (FCR-5)	4	2018	4	2018
Test/IA: Interim Authority to Operate	3	2013	3	2013
Test/IA: Initial Operational Test and Evaluation	1	2015	1	2015
Test/IA: Authority to Operate FCR-1	4	2013	4	2013
Test/IA: Authority to Operate FCR-2	2	2015	2	2015
Test/IA: Authority to Operate FCR-3	3	2016	3	2016
Test/IA: Authority to Operate FCR-4	2	2018	2	2018
Test/IA: Operational Test Readiness Review	3	2014	3	2014
Test/IA: System Qualification Test FCR-2	2	2015	2	2015
Test/IA: System Qualification Test FCR-3	3	2016	3	2016
Test/IA: System Qualification Test FCR-4	2	2018	2	2018
Test/IA: Developmental Test Fleet Capability Release - 1	1	2014	1	2014
Test/IA: Developmental Test Fleet Capability Release - 2	3	2015	3	2015
Test/IA: Developmental Test Fleet Capability Release - 3	4	2016	4	2016
Test/IA: Developmental Test Fleet Capability Release - 4	2	2018	2	2018
Test/IA: Test Level Assessment FCR-2	2	2015	2	2015
Test/IA: Test Level Assessment FCR-3	2	2016	2	2016
Test/IA: Test Level Assessment FCR-4	4	2017	4	2017
Test/IA: Operational Assessment	1	2014	1	2014
Test/IA: Limited Deployment FCR-1	2	2014	2	2014

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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 Time and Astrometry*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2344.: *Precise Time and Astrometry*	37.915	0.999	3.043	8.914	-	8.914	7.223	1.682	1.299	1.317	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

The Precise Timing and Astrometry (PTA) project funds research and development of improvements for the U.S. Master Clock (MC) System, the DoD Time Transfer capability, the Earth Orientation System, and the Astrometric Observation System. The MC System and Time Transfer provides precise time for use in modern military and National Technical Means (NTM) navigation, guidance, positioning, and tracking systems. The Earth Orientation System provides precise Earth Orientation Parameters for use by the DoD and the national civilian infrastructure to establish the specific orientation of the Earth and to provide input to the terrestrial reference frame. The Astrometric Observation System provides the basic data needed to generate the celestial reference frame which is the standard for calibrating all inertial navigation systems, satellite orbits, and earth rotation determinations. Improvement to the MC System, Time Transfer, Earth Orientation, and Astrometric Observation Systems are needed to ensure that new and upgraded DoD and NTM capabilities meet their performance requirements. By DoD Directive (CJCSI 6130.01D, encl J, of 13 Apr 2007), the U.S. Naval Observatory (USNO), Washington, D.C., is responsible for coordinating Precise Time and Time Interval (PTTI) requirements and for maintaining a PTTI reference standard (astronomical and atomic) for use by all DoD, Federal agencies, and related scientific laboratories. The Navy is also responsible for providing astronomical data for military and NTM navigation, positioning, and guidance capabilities that are space-based.

The PTA research and development efforts are focused on several areas relating to timing and time transfer: (1) Development of Rubidium Fountain Atomic Clocks and development of improved GPS Timing Receivers in order to meet the precise timing requirements for the GPS III system; (2) Research & development of the capability of distributing timing signals via Optical fiber lines, as an alternative and backup to GPS time distribution; and (3) Research & development into Optical Clock technology, which is expected to be required for future DoD systems. The PTA research and development effort is also focused on the following areas related to Earth Orientation Parameter (EOP) determination: (1) Upgrade of the Very Long Baseline Interferometry (VBLI) data acquisition system / radio telescope at Kokee Park HI; (2) Development of a Software (SW) Correlator for processing of VLBI data, necessary for the generation of Earth Orientation Parameter (EOP) data; (3) Development of the capability for electronic transmission of the VLBI data from remote VLBI sites to the USNO correlator. The new SW Correlator and the eVLBI infrastructure upgrades are necessary in order to support daily updates of EOP data required by GPS III; (4) Development of an automated end-to-end EOP processing system, which combines input from multiple data sets (e.g. VLBI data, GPS orbit data, and laser ranging data, etc.). This process is currently very labor intensive and costly. Automation is necessary to meet future DoD and GPS requirements; and (5) Modifications to the EOP system for compatibility with the new international standard -'VLBI2010'.

The Critical Time Dissemination (CTD) aspect of the PTA program develops enhanced methods of distributing and verifying precise time back to the Master Clock, UTC (USNO). The development aspect of this project has four parts: (1) Development of a mobile time link; (2) Refinement of and modernization of the Hydrogem Maser

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 Time and Astrometry*

and Auxilary Offset Generator (AOG); (3) Customize a timing system to develop a Site Verification System; and (4) Produce a fiber link system to transfer the Master Clock down long-haul fiber.

In response to these DoD requirements, this project transitions Research and Exploratory Development 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 2012	FY 2013	FY 2014
Title: Precise Timing and Astronomy	0.000	3.043	8.914
Articles:		0	0
Description: Research and development of improvements for the U.S. Master Clock (MC) System, the DoD Time Transfer capability, the Earth Orientation System, and the Astrometric Observation System. ***FY 2013 Plans:*** * Full Operation Capability (FOC) completed for Rb Fountains at USNO DC. * Develop test optical fiber link. * Conduct parallel SW and HW correlator operations/testing. * Contract awarded for VLBI Data Acquisitions System at Kokee Park, HI. Starting in FY13, the Precise Timing and Astrometry (PTA) Program will focus on replacement and upgrade of the aging VLBI Data Acquisition System (DAS) at Kokee Park, HI. The system will be converted to the new upgraded international standard (VLBI2010). The Data Acquisition System at Kokee Park, HI is a critical US-based member of an international network of VLBI radio telescopes and associated electronic systems. The VLBI radio telescope data from this telescope is needed for generation of Earth Orientation Parameters and for the Celestial Reference Frame. ***FY 2014 Plans:*** * Will achieve Initial Operation Capability (IOC) for Rb Fountains at AMC. * Antenna installation at Kokee Park, HI, and develop RFP for Radio receiver electronics and data formatting system. * Begin work on automating the Earth Orientation Parameters (EOP) processing system. * Lab demonstration of Optical Fiber timing link. * Develop a unit utilizing previously demonstrated technology to provide a mobile time link. * Create some design solutions to improve the commercially available hydrogen maser. * Produce some design and production improvements in a timing system. * Create a long haul fiber link system to produce better than 1 ns level timing system.			
Title: Precision Timing and Astronomy	0.999	0.000	0.000
Articles:	0		
FY 2012 Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Transfered Rb Fountain Master Clocks (MC) to the United States Naval Observatory (USNO) Alternate Master Clock (AMC) site. Completed IOC of Rb Fountain MC. Conducted Operational Testing (OT) on the first production of GPS M-Code timing receiver. Completed Critical Design Review (CDR) of software (SW) on correlator VLBI Earth Orientation Parameters and demonstrate SW correlator utilizing wide-band internet transmission of VLBI data from all VLBI sites.			
Accomplishments/Planned Programs Subtotals	0.999	3.043	8.914

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• OPN/0305112N/LI 8126: *Oceanography (USNO Astrometric Telescope Subsystem funds for purchase of Software Correlator*	0.000	1.156	0.290		0.290	0.000	0.000	0.000	0.000	0.000	1.446

Remarks

D. Acquisition Strategy

The included technology developments are primarily in-house with selected contractor participation. However, the Kokee Park, HI radio telescope upgrade and the SW Correlator (OPN-funded) contract will involve substantial non-Navy contract support.
Management oversight by Program Executive Officer for Command, Control, Communications, Computers, and Intelligence.

E. Performance Metrics

(1) The Software Correlator will complete Phase 2 and will achieve Initial Operational Capability (IOC).
(2) Antenna will be installed at Kokee Park, HI.
(3) Rb Fountain System will reach FOC at AMC in FY15.
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 2014 Navy		DATE: April 2013
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 Time and Astrometry*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development (Antenna Procurement)	SS/CPFF	TBD:Kokee Park, HI	0.000	0.000		1.783	Jun 2013	0.000		-		0.000	Continuing	Continuing	Continuing
Primary Hardware Development (Site Prep)	TBD	TBD:TBD	0.000	0.000		0.000		0.750	Feb 2014	-		0.750	0.000	0.750	
Primary Hardware Development (Antenna Receiver Electronics)	MIPR	TBD:TBD	0.000	0.000		0.000		1.000	May 2014	-		1.000	0.000	1.000	
Primary Hardware Development for CTD (Critical Mobil Pod)	MIPR	Classified:Not Specified	0.000	0.000		0.000		1.500	Oct 2013	-		1.500	0.000	1.500	
Primary Hardware Development for CTD (Maser & AOG Upgrade)	C/IDIQ	Federated IT:Not Specified	0.000	0.000		0.000		0.200	Dec 2013	-		0.200	0.000	0.200	
Primary Hardware Development for CTD (Develop Site Verification System)	C/IDIQ	Federated IT:Not Specified	0.000	0.000		0.000		1.000	Dec 2013	-		1.000	0.000	1.000	
Primary Hardware Development for CTD (Fiber Link System)	SS/FFP	Linear Photonics:Not Specified	0.000	0.000		0.000		2.600	Mar 2014	-		2.600	0.000	2.600	
Ancillary Hardware Development 1	Various	U.S. Naval Observatory:Washington, DC	0.000	0.000		0.140	Jan 2013	0.040	Oct 2013	-		0.040	0.000	0.180	
Ancillary Hardware Development 2	Various	U.S. Naval Observatory:Washington, DC	0.000	0.000		0.000		0.040	Jan 2014	-		0.040	0.000	0.040	
Ancillary Hardware Development 3	Various	U.S. Naval Observatory:Washington, DC	0.000	0.000		0.000		0.084	Apr 2014	-		0.084	0.000	0.084	
Product Development	WR	The Naval Observatory:Washington, DC	18.672	0.999	Oct 2011	0.000		0.000		-		0.000	0.000	19.671	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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 Time and Astrometry*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Precise Timing & Astrometry	Various	Various:Various	19.144	0.000		0.000		0.000		-		0.000	0.000	19.144	
		Subtotal	37.816	0.999		1.923		7.214		0.000		7.214			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support (All PTA - Labor) 1	TBD	U.S. Naval Observatory (Civilian Labor):Washington, DC	0.000	0.000		0.100	Oct 2012	0.195	Oct 2013	-		0.195	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 2	TBD	U.S. Naval Observatory (Civilian Labor):Washington, DC	0.000	0.000		0.200	Jan 2013	0.195	Jan 2014	-		0.195	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 3	TBD	U.S. Naval Observatory (Civilian Labor):Washington, DC	0.000	0.000		0.200	Apr 2013	0.195	Apr 2014	-		0.195	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 4	TBD	U.S. Naval Observatory (Civilian Labor):Washington, DC	0.000	0.000		0.200	Jul 2013	0.195	Jul 2014	-		0.195	Continuing	Continuing	Continuing
Software Development (SW Correlator GUI)	SS/FFP	CPI:Not Specified	0.000	0.000		0.130	Feb 2013	0.000		-		0.000	0.000	0.130	
Software Development (EOP Automation)	C/FFP	TBD:Not Specified	0.000	0.000		0.000		0.600	Dec 2013	-		0.600	0.000	0.600	
Travel 1	TBD	U.S. Naval Observatory (Civilian Travel):Varies	0.000	0.000		0.000		0.017	Oct 2013	-		0.017	0.000	0.017	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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 Time and Astrometry*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel 2	TBD	U.S. Naval Observatory (Civilian Travel):Varies	0.000	0.000		0.000		0.017	Jan 2014	-		0.017	0.000	0.017	
Travel 3	TBD	U.S. Naval Observatory (Civilian Travel):Varies	0.000	0.000		0.020	Apr 2013	0.018	Apr 2014	-		0.018	0.000	0.038	
Travel 4	TBD	U.S. Naval Observatory (Civilian Travel):Varies	0.000	0.000		0.020	Jul 2013	0.018	Jul 2014	-		0.018	0.000	0.038	
		Subtotal	0.000	0.000		0.870		1.450		0.000		1.450			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Management Contractor Services (Kokee Park Antenna Project)	C/FFP	TBD:TBD	0.000	0.000		0.250	Jun 2013	0.250	Jun 2014	-		0.250	Continuing	Continuing	Continuing
Acquisition Workforce	Various	Various:Various	0.099	0.000		0.000		0.000		-		0.000	0.000	0.099	
		Subtotal	0.099	0.000		0.250		0.250		0.000		0.250			

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	37.915	0.999		3.043		8.914		0.000		8.914			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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 Time and Astrometry*

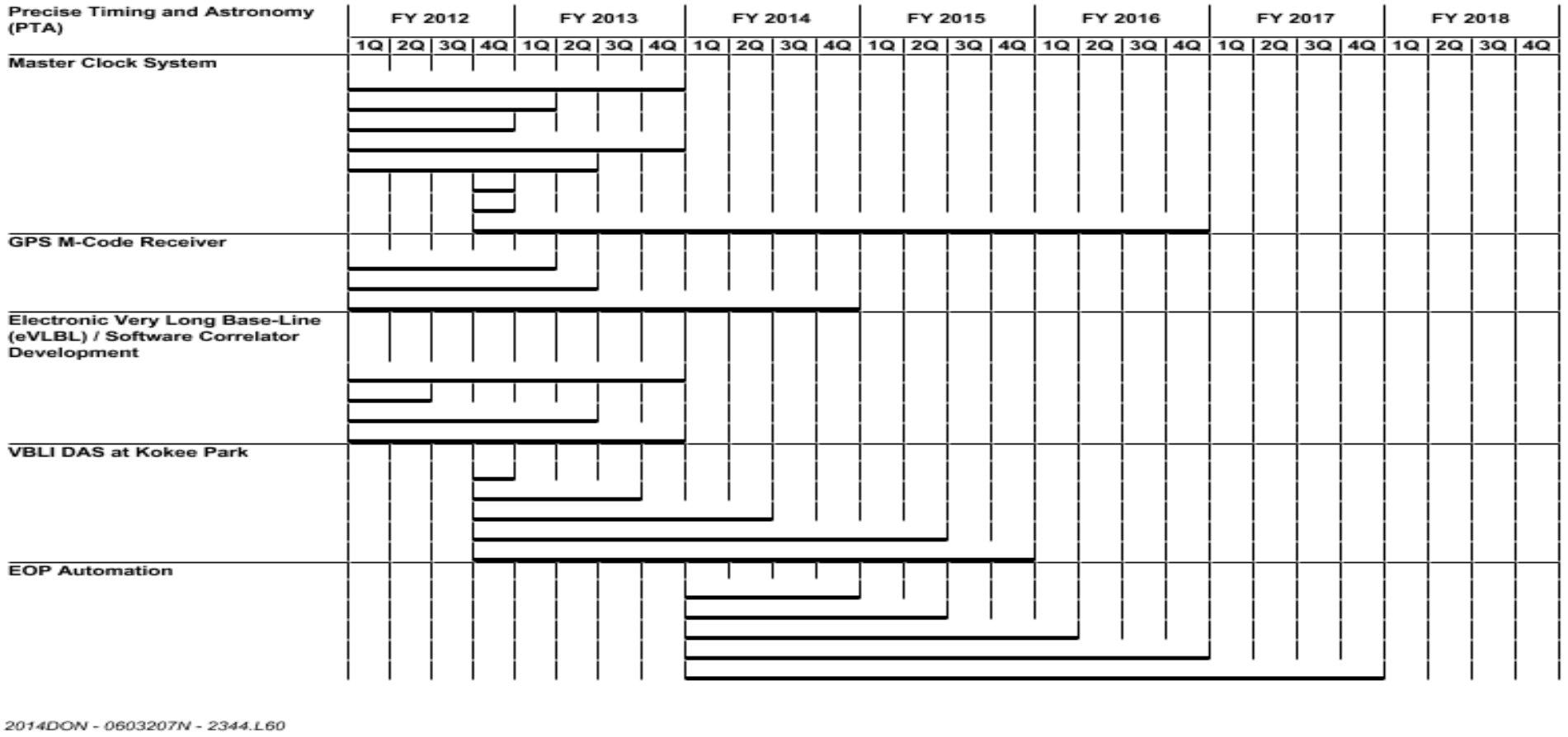

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 2344.: *Precise Time and Astrometry*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Precise Timing and Astronomy (PTA)				
Master Clock System: Rubidium (Rb) Fountain	1	2012	4	2013
Master Clock System: Rb Fountain Initial Operational Capability (IOC) - Milestone C (MC)	1	2012	1	2013
Master Clock System: IOC for Rb Fountain Clocks at AMC	1	2012	4	2012
Master Clock System: Rb Full Operational Capability (FOC) - MC	1	2012	4	2013
Master Clock System: Rb FOC - AMC	1	2012	2	2013
Master Clock System: Optical Fiber Time Transmission	4	2012	4	2012
Master Clock System: Fiber Time Transmission in Baltimore/DC Area	4	2012	4	2012
Master Clock System: Fiber Time Transmission - Urban Demo	4	2012	4	2016
GPS M-Code Receiver: AF OCX Project Critical Design Review (CDR)	1	2012	1	2013
GPS M-Code Receiver: M-Code IOC at USNO	1	2012	2	2015
GPS M-Code Receiver: M-Code FOC at USNO	1	2012	4	2018
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: Wide Band eVBLI Operations Start	1	2012	4	2013
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: CDR Software COR	1	2012	2	2012
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: IOC - Software COR	1	2012	2	2013
Electronic Very Long Base-Line (eVLBL) / Software Correlator Development: FOC - SW COR Upgrade	1	2012	4	2014
VBLI DAS at Kokee Park: Finalize System Design	4	2012	4	2012
VBLI DAS at Kokee Park: Antenna Procurement Contract	4	2012	3	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
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 Time and Astrometry*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VBLI DAS at Kokee Park: Kokee Park Site Preparation	4	2012	2	2014
VBLI DAS at Kokee Park: Contract to procure receiver and electronic infrastructure	4	2012	3	2014
VBLI DAS at Kokee Park: IOC	4	2012	4	2015
VBLI DAS at Kokee Park: FOC	4	2012	3	2016
EOP Automation: PDR	1	2014	4	2014
EOP Automation: Preliminary Automated SW	1	2014	1	2016
EOP Automation: IOC	1	2014	2	2017
EOP Automation: FOC	1	2014	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
3207: *Fleet Synthetic Training*	0.943	0.936	1.041	2.853	-	2.853	2.889	1.105	1.124	1.144	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

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.

Ballistic Missile Defense (BMD) FST at Sea funding will provide the capability to conduct integrated Live, Virtual and Constructive (LVC) single or multi-ship exercises with ships at sea using the Navy Continuous Training Environment (NCTE). This capability will support BMD mission area Fleet training and mission rehearsal in theater, allow ships to participate in Combatant Command (COCOM) mandated BMD exercises while pierside or underway, as well as enhance BMD training objective accomplishment in current Fleet Requirements Training Plan (FRTP) underway training events such as Composite Training Unit Exercises (COMPTUEX) and Joint Task Force Exercises (JTFEX). The NCTE and FST directly support Fleet training readiness and strike group and BMD platform deployment certifications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: Ballistic Missile Defense Fleet Synthetic Training	0.000	0.000	1.883
Articles:			0
Description: Develop a distributed training capability to provide simulation data via a satellite network to the ship underway to stimulate the combat systems. Coordinate efforts with NAVSEA, SPAWAR, and NAVAIR.			
FY 2014 Plans: * Develop a distributed training capability to provide simulation data via a satellite network to the ship underway to stimulate the combat systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 2012	FY 2013	FY 2014
* Coordinate efforts with Naval Air Warfare Center Training System Division (NAWC TSD) and Naval Surface Warfare Center (NSWC). Develop BMD FST at Sea capability to support BMD Mission Area training and Mission Rehearsal in Theater. Test and certification of the capability will be conducted FY 2015.			
Title: Fleet Synthetic Training	0.936	1.041	0.970
Articles:	0	0	0
Description: Develop and deliver software that characterizes the ocean and atmospheric environments; adjusts to meet fleet-required training scenarios; allows synthetic training to be conducted in areas of planned and contingency operations; and, provides sufficient detail to simulate the real-world conditions of the physical environment in those areas of interest. Accomplishments include development of meteorological and oceanographic environmental databases for total of 10 of 14 Navy Continuous Training Environment (NCTE) exercise areas. Conducted data and architecture testing between Commander, Naval Meteorology and Oceanography Command (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 by providing synthetic satellite/radar imagery based on synthetic enviromental data. Made improvements in generating acoustic performance products used by Anti-Submarine Warfare (ASW) white cell and ASW commander staff. Conducted verification and validation of acoustic performance products. ***FY 2012 Accomplishments:*** Developed meteorological and oceanographic environmental databases for total of 14 Navy Continuous Training Environment (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 14 NCTE areas. Enhanced realism of training environment by expanding major training areas to provide better upstream data and providing synthetic satellite/radar imagery based on synthetic environmental data. Made improvements in generating acoustic performance products used by Anti-Submarine Warfare (ASW) white cell and ASW commander staff. Conducted verification and validation of acoustic performance products. Initiated study to measure effectiveness of meteorologic and oceanographic products during FST events to better support exercises and real world operations. ***FY 2013 Plans:*** * Develop/implement Environmental Data Cube Support System (EDCSS) production capability at Navy Warfare Development Command (NWDC) * Develop Live Virtual Constructive capability in support of Fleet Synthetic training events * Research "Modeling on Demand" capability via EDCSS			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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 2012	FY 2013	FY 2014
* Research Modeling on Demand capability using High Performance Computing at Defense Shared Resource Center ***FY 2014 Plans:*** * Research/Implement automated Tactical Oceanographic Forecast products * Develop additional performance surface capability enhancements * Complete development of Machine-to-Machine (M2M) capability for Environmental Data Cube Support System (EDCSS) interface in support of environmental product generation * Implement "Modeling on Demand" capability			
Accomplishments/Planned Programs Subtotals	0.936	1.041	2.853

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

1) CNMOC will produce meteorological and oceanographic environmental databases for all Navy Continuous Training Environment (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 Meteorological and Oceanographic Command (METOC) data to the NCTE. Data and products will be available via NEP-Oc, DVD and/or Machine-to-Machine (M2M) during planning and execution of FST events.

3) CNMOC will produce products based on synthetic ocean environment and synthetic satellite/radar imagery based on meteorological environmental data for all NCTE exercise areas. Products are utilized in planning and execution of FST events.

4) NWDC, in FY14, will develop, in coordination with Naval Air Warfare Center Training System Division (NAWC TSD) and Naval Surface Warfare Center (NSWC), the capability to provide simulation data to the ship underway to stimulate the combat systems.

5) NWDC, in FY15, will lead, in coordination with NAWC TSD and NSWC, the test and certification of the capability for BMD FST at Sea.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWC TSD:Orlando, FL	0.000	0.000		0.248	Jun 2013	0.000		-		0.000	0.248	0.496	
		Subtotal	0.000	0.000		0.248		0.000		0.000		0.000	0.248	0.496	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NRL / AER:MS / CA / VA	0.471	0.083	Nov 2011	0.300	Nov 2012	0.500	Nov 2013	-		0.500	Continuing	Continuing	Continuing
Software Development	SS/CPFF	AER / GEOCENT:VA / MS	0.237	0.480	Nov 2011	0.493	Jan 2013	0.370	Jan 2014	-		0.370	Continuing	Continuing	Continuing
Configuration Management	WR	AER / GEOCENT:VA / MS	0.135	0.247	Feb 2012	0.000		0.100	Mar 2014	-		0.100	0.000	0.482	
Studies and Analysis	Various	Various:Various	0.100	0.126	Jun 2012	0.000		0.000		-		0.000	0.000	0.226	
Software Development	MIPR	Alion Science & Technology:Norfolk, VA	0.000	0.000		0.000		1.133	Nov 2013	-		1.133	0.000	1.133	
Testing/Certification	WR	NSWC:Dahlgren, VA	0.000	0.000		0.000		0.250	Nov 2013	-		0.250	0.000	0.250	
TCSS Development	WR	NAWC TSD:Orlando, FL	0.000	0.000		0.000		0.500	Nov 2013	-		0.500	0.000	0.500	
		Subtotal	0.943	0.936		0.793		2.853		0.000		2.853			

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.943	0.936		1.041		2.853		0.000		2.853			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*

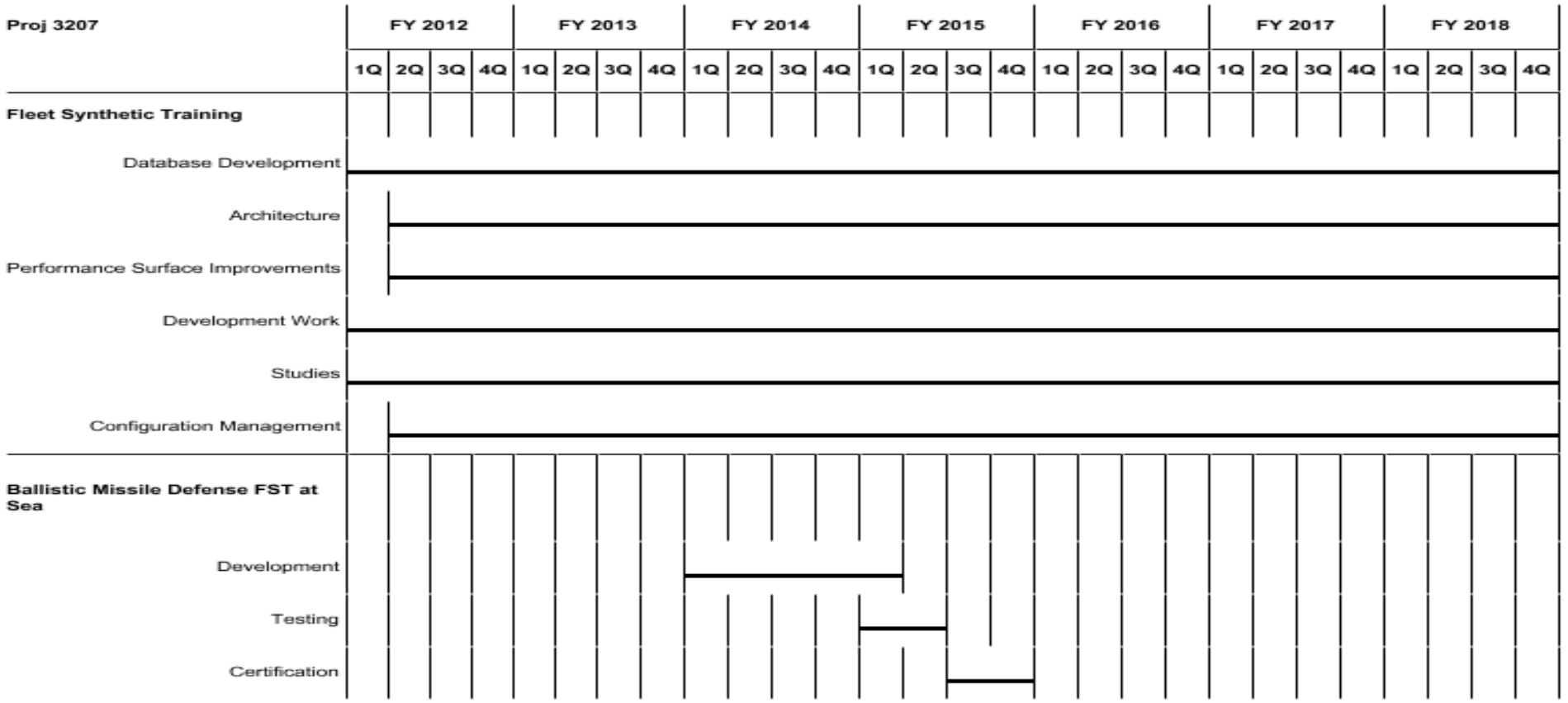

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3207: *Fleet Synthetic Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3207				
Fleet Synthetic Training: Database Development:	1	2012	4	2018
Fleet Synthetic Training: Architecture:	2	2012	4	2018
Fleet Synthetic Training: Performance Surface Improvements:	2	2012	4	2018
Fleet Synthetic Training: Development Work:	1	2012	4	2018
Fleet Synthetic Training: Studies:	1	2012	4	2018
Fleet Synthetic Training: Configuration Management:	2	2012	4	2018
Ballistic Missile Defense FST at Sea: Development: Schedule Detail	1	2014	1	2015
Ballistic Missile Defense FST at Sea: Testing: Schedule Detail	1	2015	2	2015
Ballistic Missile Defense FST at Sea: Certification: Schedule Detail	3	2015	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
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)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
3229: *JMAPS*	117.885	18.800	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	136.685
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

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 error 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 JMAPS initiative was to satisfy the emerging requirements for a new high accuracy star catalog through a space-based. However, the program was ahead of current war-fighter requirements and was terminated by Navy eliminating funding in FY13 and out.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: JMAPS	18.800	0.000	0.000
Articles:	0		
FY 2012 Accomplishments: JMAPS closed out all Preliminary Design Review (PDR) activities, with the exception of the ground segment, and began advance design and engineering activities. Completed spacecraft bus component fabrication and delivered in place. Completed instrument design including detector and partial instrument electronics, finalized the optical telescope design, and initialized telescope production. Final deliveries of the sensor chip assemblies occured and chip integration into the Focal Plane Assembly (FPA) began. Delivery of the engineering model for FPA occured. Updated Mission performance analysis based on instrument and bus design and available test data. All design and development completed captured program state at time of termination or enabled transition of selected components to leverage current investment in technology development.			
Accomplishments/Planned Programs Subtotals	18.800	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
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*

D. Acquisition Strategy

The program was ahead of current war-fighter requirements and was terminated by Navy eliminating funding in FY13 and out.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Instrument Development & Integration	WR	Naval Research Laboratory:Washington, DC	54.110	6.482	Dec 2011	0.000		0.000		-		0.000	0.000	60.592	
Space Bus	SS/CPFF	AeroAstro, Inc.:Ashburn, VA	30.749	5.707	Dec 2011	0.000		0.000		-		0.000	0.000	36.456	
Optical Telescope	SS/CPFF	L3 Communications SSG:Tinsley, Wilmington, MA	6.799	3.604	Jan 2012	0.000		0.000		-		0.000	0.000	10.403	
Sensor Chip Assembly	SS/CPFF	Teledyne Scientific & Imaging (AKA Rockwell Intl.):Camarillo, CA	1.998	1.977	Jan 2012	0.000		0.000		-		0.000	0.000	3.975	
Mission Analysis	WR	United States Naval Observatory:Washington, DC	2.769	0.625	Jan 2012	0.000		0.000		-		0.000	0.000	3.394	
Algorithm Development	WR	United States Naval Observatory:Washington, DC	6.018	0.000		0.000		0.000		-		0.000	0.000	6.018	
System Requirements	Various	Various:Various	13.244	0.000		0.000		0.000		-		0.000	0.000	13.244	
		Subtotal	115.687	18.395		0.000		0.000		0.000		0.000	0.000	134.082	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 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	0.199	Nov 2011	0.000		0.000		-		0.000	0.000	0.557	Continuing
Trade-Off Studies	C/CPFF	AEROSPACE:Albuquerque, NM	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	0.200
Systems and Technical Support	Various	Universities/ Colleges:Various	0.150	0.000	Feb 2012	0.000		0.000		-		0.000	0.000	0.150	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
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	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.708	0.199		0.000		0.000		0.000		0.000	0.000	0.907	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	SS/CPFF	BAH:San Diego, CA	0.365	0.206	Dec 2011	0.000		0.000		-		0.000	0.000	0.571	
PMO Support	SS/CPFF	ITS:Arlington, VA	1.125	0.000		0.000		0.000		-		0.000	0.000	1.125	Continuing
		Subtotal	1.490	0.206		0.000		0.000		0.000		0.000	0.000	1.696	

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	117.885	18.800		0.000		0.000		0.000		0.000	0.000	136.685	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
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*

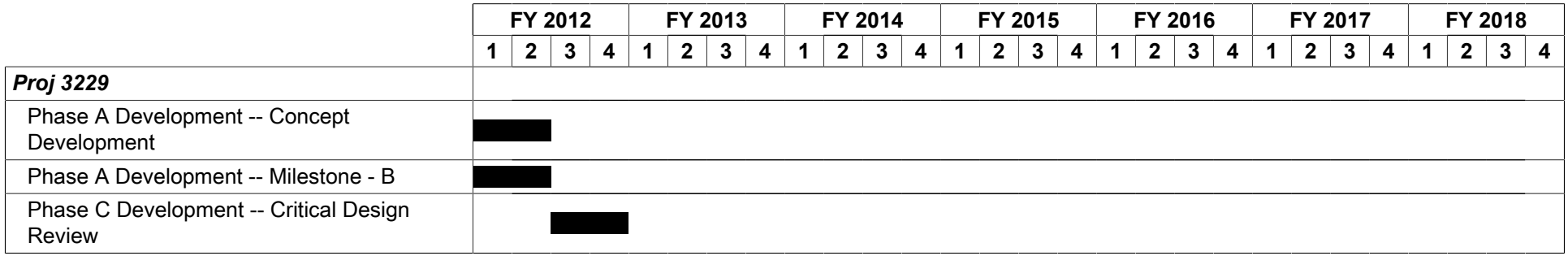

Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603207N: *Air/Ocean Tactical Applications*	**PROJECT** 3229: *JMAPS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3229				
Phase A Development -- Concept Development	1	2012	2	2012
Phase A Development -- Milestone - B	1	2012	2	2012
Phase C Development -- Critical Design Review	3	2012	4	2012