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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Navy **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 7: Operational Systems Development</i>					<b>R-1 Program Element (Number/Name)</b> PE 0305160N / <i>Navy Meteorological and Ocean Sensors-Space(METOC)</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	2.284	0.356	0.599	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.239
0524: <i>Navy METOC Support (SPACE)</i>	2.284	0.356	0.599	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.239

**A. Mission Description and Budget Item Justification**

This program element supports the Navy's requirements in meteorological and oceanographic (METOC) space-based remote sensors. These requirements include commitments to satellite, sensor, and operational demonstration/development activities as well as the transition to fleet applications associated with the joint Defense Meteorological Satellite Program (DMSP).

The Navy METOC Space-Based Sensing Capabilities project provides for Navy participation in Navy/Air Force cooperative efforts leading to DMSP sensor development, and specifically participation in the calibration and validation of instruments and delivery of satellite products to the fleet. The passive microwave instruments carried on the DMSP satellites provide global and atmospheric data of direct operational relevance, including sea surface wind, sea ice, and precipitation.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	0.359	0.599	60.679	-	60.679
Current President's Budget	0.356	0.599	0.000	-	0.000
Total Adjustments	-0.003	0.000	-60.679	-	-60.679
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.003	0.000			
• Program Adjustments	0.000	0.000	-60.679	-	-60.679

**Change Summary Explanation**

The FY 2017 funding request in the amount of \$60.009 million for the Navy's Geodetic/geophysical Satellite (GEOSAT) Follow-On 2 (GFO-2) was eliminated.

The FY 2017 funding request of \$.67 million is realigned to Program Element 0603207N, Project 2342.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0305160N / Navy Meteorological and Ocean Sensors-Space(METOC)				<b>Project (Number/Name)</b> 0524 / Navy METOC Support (SPACE)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
0524: Navy METOC Support (SPACE)	2.284	0.356	0.599	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.239
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Meteorology and Oceanography (METOC) Space-Based Sensing Capabilities project provides for Navy participation in the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager and Special Sensor Microwave Imager Sounder calibration/validation efforts in support of the fleet operational requirements. The passive microwave instrument carried on DMSP provides global oceanic and atmospheric data of direct operational relevance, including sea surface wind speed, sea ice, and precipitation.

The METOC Space-Based Sensing Capabilities project ensures the naval service's operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP, the Joint Polar Satellite System (JPSS) and the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellites (GOES). These efforts fulfill naval service unique requirements that are not funded within the DMSP, JPSS or GOES programs, and are in accordance with current inter-agency agreements.

Beginning in FY 2017 funding was realigned to Program Element 0603207N, Project 2342.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> METOC Space-Based Sensing Capabilities	0.356	0.599	0.000	0.000	0.000
<b>Articles:</b>	-	-	-	-	-
<b>FY 2015 Accomplishments:</b>					
Performed assessment of planned national earth observing satellite system's sensor data Sentinel 3a and 3b launch for use in Navy Atmospheric and Oceanographic Prediction Models.					
<b>FY 2016 Plans:</b>					
Continue performance assessment on National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) and Defense Meteorological Satellite Program (DMSP) satellite sensor suites. Continue assessment of planned environmental satellite sensor launches such as Geostationary Operational Environmental Satellite R-Series (GOES-R) and Global Change Observation Mission (GCOM) W-2 scheduled in FY16.					
<b>FY 2017 Base Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305160N / Navy Meteorological and Ocean Sensors-Space(METOC)	<b>Project (Number/Name)</b> 0524 / Navy METOC Support (SPACE)

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Funding was realigned to PE 0603207N, project 2342.					
<b>FY 2017 OCO Plans:</b> N/A					
<b>Accomplishments/Planned Programs Subtotals</b>	0.356	0.599	0.000	0.000	0.000

<b>C. Other Program Funding Summary (\$ in Millions)</b>												
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	
• RDTEN/0603207N/2342: METOC DATA ASSIMILATION AND MOD	4.891	8.168	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
 Naval service unique, space based Meteorology and Oceanography (METOC) requirements. Particular sensors or data sources with unique naval service mission needs are targeted to accelerate acquisition or ensure threshold accomplishment of Joint or converged national program plans. The Joint Polar Satellite System (JPSS) program will collect global microwave radiometry and sounding data to produce microwave imagery and other meteorological and oceanographic data. Conical Microwave Imager Sounder (CMIS) can be viewed as the follow-on instrument to the Special Sensor Microwave (SSM) instruments Navy developed for the Defense Meteorological Satellite Program. These CMIS sensors will be acquired as part of the JPSS architecture which supports these Navy requirements in the future. Maintenance of rigorous sensor calibration and data validation for operational SSM instruments continues along with algorithm development in support of fleet applications. The Advanced Altimeter technologies will improve radar altimeter resolution and aerial coverage to support Navy requirements for sea surface topography measurement in the littorals.

**E. Performance Metrics**  
 Goal: Provide precise and near real-time METOC forecasting to the warfighter using existing and future space-based satellite derived data, including ocean surface wind speed, rain rate, ice concentration, and soil moisture measurements.  
 Metric: Provide precise ocean surface wind speed within plus or minus 2.0 meters per second, the rain over land and ocean rate within plus or minus 5.0 millimeters per hour, soil moisture measurements within plus or minus 10%; and sea ice concentrations within plus or minus 10%.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305160N / Navy Meteorological and Ocean Sensors-Space(METOC)	<b>Project (Number/Name)</b> 0524 / Navy METOC Support (SPACE)
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Software Development	WR	Naval Research Laboratory : Monterey, CA	1.873	0.352	Nov 2014	0.587	Nov 2015	0.000		-		0.000	0.000	2.812	-
<b>Subtotal</b>			1.873	0.352		0.587		0.000		-		0.000	0.000	2.812	-

<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Support	WR	SSC Pacific : San Diego, CA	0.330	0.000		0.000		0.000		-		0.000	0.000	0.330	-
<b>Subtotal</b>			0.330	0.000		0.000		0.000		-		0.000	0.000	0.330	-

<b>Management Services (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Acquisition Management	C/CPFF	PSS/BAH : San Diego, CA	0.081	0.004	Jun 2015	0.012	Dec 2015	0.000		-		0.000	0.000	0.097	-
<b>Subtotal</b>			0.081	0.004		0.012		0.000		-		0.000	0.000	0.097	-

			Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			2.284	0.356	0.599	0.000	-	0.000	0.000	3.239	-

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2017 Navy</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305160N / Navy Meteorological and Ocean Sensors-Space(METOC)	<b>Project (Number/Name)</b> 0524 / Navy METOC Support (SPACE)

FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<b>Proj 0524</b>	
Navy METOC (SPACE): Schedule Detail	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305160N / Navy Meteorological and Ocean Sensors-Space(METOC)	<b>Project (Number/Name)</b> 0524 / Navy METOC Support (SPACE)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 0524</b>				
Navy METOC (SPACE): Schedule Detail	1	2015	4	2016