Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Navy											Date: March 2014	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204228N *I Surface Support*							
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
Total Program Element	3.292	2.999	2.374	2.878	-	2.878	2.340	2.159	2.206	2.262	Continuing	Continuing
3311: *Navigation Systems*	3.292	2.999	2.374	2.878	-	2.878	2.340	2.159	2.206	2.262	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

The Surface Support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) to support the Ballistic Missile Defense (BMD) mission. The program will implement systems engineering processes to identify specific BMD performance requirements, investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing.

The Navy's current INS is the AN/WSN-7(V) Ring Laser Gyro Navigator (RLGN), a legacy 1980's design that was first installed in 1998 and is now obsolete. This is a proprietary design. Estimates to redesign obsolete components for new production systems for SCN platforms exceed current budgets. The RLGN is reaching its limit with respect to providing the high-accuracy navigation solution required to meet known and emerging mission requirements. Navigator of the Navy's Vision 2025 identifies emergent requirements with respect to improved navigation in a GPS denied environment, littoral warfare, mine countermeasures, and manned and unmanned vehicle operations that cannot be met with existing systems. The RLGN employs an Inertial Measuring Unit (IMU) with three single-axis ring laser gyros that allow the system to provide continuous and automatic data outputs of the ship's geographic position (latitude, longitude), horizontal and vertical linear velocity (Ve, Vn, Vv), attitude (heading, roll, and pitch) and attitude rates. The INS provides mission critical ship's position and attitude data to shipboard sensors (such as radars), combat systems, gun, and missile systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in absence of GPS.

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Navy					Date: March 2014
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0204228N / *Surface Support*		
B. Program Change Summary ($ in Millions)	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO**	**FY 2015 Total**
Previous President's Budget	4.171	2.374	3.099	-	3.099
Current President's Budget	2.999	2.374	2.878	-	2.878
Total Adjustments	-1.172	-	-0.221	-	-0.221
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.091	-			
• Rate/Misc Adjustments	-	-	-0.221	-	-0.221
• Congressional General Reductions Adjustments	-0.281	-	-	-	-
• Congressional Directed Reductions Adjustments	-0.800	-	-	-	-

Change Summary Explanation

FY 2013 reductions reflect Congressionally mandated sequestration and general reductions.
FY 2015 reductions reflect the Department's decision to reduce contracted services.

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy			Date: March 2014
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204228N / *Surface Support*	Project (Number/Name) 3311 / *Navigation Systems*	

COST ($ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
3311: *Navigation Systems*	3.292	2.999	2.374	2.878	-	2.878	2.340	2.159	2.206	2.262	Continuing	Continuing
Quantity of RDT&E Articles	0.000	-	-	-	-	-	-	-	-	-		

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

The Surface Support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) to support the Ballistic Missile Defense (BMD) mission. The program will implement systems engineering processes to identify specific BMD performance requirements, investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
Title: Systems Engineering	2.999	2.374	2.878
Articles:	-	-	-
FY 2013 Accomplishments: - Developed Inertial Sensor Module (ISM) specifications and procurement documents. - Developed New Processing Module (NPM) hardware/software design. - Developed INS-R Modeling and Simulation capability.			
FY 2014 Plans: - Award competitive contract for ISM development. - NPM development hardware/software.			

Exhibit R-2A, RDT&E Project Justification: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2013	FY 2014	FY 2015
- Procure NPM Engineering Development Module (EDM) hardware. ***FY 2015 Plans:*** - NPM development hardware/software. - NPM EDM integration. - Procure NPM Pre-Production Unit (PPU). - Award ISM contract. - ISM development procure EDM hardware.			
Accomplishments/Planned Programs Subtotals	2.999	2.374	2.878

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
• OPN/0670: *Other Navigation*	21.219	33.386	45.431	-	45.431	54.278	43.646	64.504	64.288	-	551.796

Remarks

D. Acquisition Strategy

Procurement of the Inertial Navigation System (INS) planned to begin in FY2016.

E. Performance Metrics

FY13:
- Initial NPM hardware/software development.
- Initial INS-R Modeling and Simulation capability.
- Completed INS-R CDD.

FY14:
- NPM development hardware/software.

FY15:
- Award competitive contract for ISM development.
- NPM development hardware/software.
- Procure NPM PPU
- Complete NPM EDM.

Exhibit R-4, RDT&E Schedule Profile: PB 2015 Navy		Date: March 2014
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*