Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											**Date:** May 2017	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*							**R-1 Program Element (Number/Name)** PE 0603596N *I (U)LCS Mission Modules*					
COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	202.035	188.872	160.058	116.871	-	116.871	78.302	52.996	32.560	22.721	Continuing	Continuing
3129: *LCS Mission Package Development*	202.035	188.872	160.058	116.871	-	116.871	78.302	52.996	32.560	22.721	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 443

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funds for detailed design, development, issue resolution, certification, integration, and testing of the Littoral Combat Ship (LCS) Mission Modules (MM). LCS is a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and ensure naval and joint force access into contested littoral regions. It uses open-systems architecture design, modular weapons, sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littoral.

The LCS MMs provide tailored warfighting capability for one at a time of the three focused mission areas:

MCM - Provides capability to conduct minehunting (detection, localization, classification, identification, and neutralization) and mine sweeping operations for mine threats.
SUW - provides capability to conduct enhanced-range coordinated detection, tracking, classification, identification, and neutralization of groups of attacking, multiple, small boat threats, and to conduct maritime security missions.
ASW - provides capability to detect, classify, localize, and prosecute enemy submarines; counter diesel submarine threats in the littoral shallow waters and their associated deep water approaches; and to provide an escort capability for forces transiting through submarine threat areas.

B. Program Change Summary ($ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	203.143	160.058	72.820	-	72.820
Current President's Budget	188.872	160.058	116.871	-	116.871
Total Adjustments	-14.271	0.000	44.051	-	44.051
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-10.000	0.000			
• SBIR/STTR Transfer	-4.271	0.000			
• Program Adjustments	0.000	0.000	42.875	-	42.875

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy		Date: May 2017
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• Rate/Misc Adjustments	0.000	0.000	1.176	-	1.176

Change Summary Explanation
FY16:

SBIR - $4.271M

Realignment of Condition Based Maintenance Congressional Add - $10.000M

FY18:

Increase in FY18, funds the completion of the ASW Pre-Production test Article, exercise the contract option to develop and deliver the ASW Escort Mission Module (EMM) Integrated Logistics package, development of the training curriculum, procurement of the peculiar support equipment to support land-base testing in FY18 and at sea testing starting in FY19, procurement of testing spares to support Developmental and Operational testing, development of the Technical Data Package (TDP), and certification of the Manufacturing Data Package to support transition to production in FY19.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319 I 4					R-1 Program Element (Number/Name) PE 0603596N I (U)LCS Mission Modules				Project (Number/Name) 3129 I LCS Mission Package Development			
COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
3129: LCS Mission Package Development	202.035	188.872	160.058	116.871	-	116.871	78.302	52.996	32.560	22.721	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 443

A. Mission Description and Budget Item Justification

Program provides focused war fighting capabilities in littoral mine countermeasures, countering small boat threats, and littoral anti-submarine warfare to provide ensured access to enable the US Joint Force operations in the littorals. A mission package is a combination of warfare mission modules with specialized crew, support equipment, and vehicles including manned helicopters and unmanned maritime systems. They are packaged in a modular fashion so that they can be quickly swapped out pier side. Mission module development includes architectures, interfaces, and integration of mission systems. Mission systems integration also includes the procurement of the first mission packages (MPs) to be used on the Flight 0+ Littoral Combat Ships (LCS). Although the total quantity is under review due to LCS ship and Frigate quantity adjustments, the numerical distribution of mission packages across the LCS/Frigate fleet is not expected to change the Program of Record within the FYDP. The Navy will determine the numerical distribution of MCM, SUW, and ASW MPs across the LCS/Frigate Fleet. The systems to be fielded as part of the MPs and the required RDT&E efforts will not be affected by the LCS and Frigate quantity adjustments. The LCS will be focused-mission ships that have the ability to embark the SUW, MCM, or ASW MPs. The Frigate will be multi-mission ships, with certain SUW and ASW war-fighting capabilities installed.

An incremental development approach to delivering capability allows the continued insertion of mature capabilities throughout the life of the program without the need for modifications to the sea frames. Future MP capabilities will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective, enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, one of the most important benefits of LCS modular design.

The LCS Mine Countermeasures (MCM) MP will counter deep, shallow, and tethered mines in the littoral without putting Sailors in the minefield. When the MCM MP is embarked, LCS is capable of conducting detect-to-engage operations (hunting, sweeping, and neutralization) against very shallow and deep-water sea mine threats. The MCM MP provides these capabilities through the use of sensors and weapons deployed from an MH-60S multi-mission helicopter, unmanned off-board vehicles, and support equipment/containers. The MCM MP consists of the following modules:
- Remote Minehunting (RMH) Module: MCM - Unmanned Surface Vehicle (MCM-USV) AQS-20 Mine hunting Sonar
- Coastal Mine Reconnaissance (CMR) Module: Coastal Battlefield Reconnaissance & Analysis (COBRA) and the MQ-8B Fire Scout Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV)
- Near Surface Detection (NSD) Module: Airborne Laser Mine Detection System (ALMDS) and the MH-60S Helicopter
- Airborne Mine Neutralization (AMN) Module: Airborne Mine Neutralization System (AMNS), MH-60S Helicopter, and Barracuda
- Unmanned Mine Sweep (UMS) Module: Unmanned Influence Sweep System (UISS) (which is comprised of the MCM USV and the Unmanned Surface Sweep System (US3)

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- Buried Minehunting (BMH) Module: Knifefish Unmanned Underwater Vehicle (UUV)

The RMH Module uses a MCM USV and an AQS-20 to provide sustained mine hunting and clearing from the surface. The UMS Module provides endurance bottom sweep capability, the CMR Module will allow detection of minefield patterns and obstacles from an embarked Fire Scout VTUAV in the beach zone, and the BMH Module will allow detection of buried mines. When complete, the MCM MP will provide full capability against floating, tethered, bottom, and buried mines.

The ASW MP enables LCS to conduct detect-to-engage operations against modern submarines that pose a threat. Specific ASW capabilities include protecting forces in transit, protecting joint operating areas, and establishing ASW barriers.

The ASW MP provides the warfighter capabilities that can be employed for ASW area search as well as high value unit escort missions. Key components of the ASW MP include a Light Weight Tow torpedo countermeasure, a Variable Depth Sonar, and a Multi-Function Towed Array. These individual systems are combined into three modules: Torpedo Defense Countermeasure Module; an ASW Escort Mission Module that provides High value unit escort capability; and an Aviation Module that offers airborne threat localization and engagement capability through a MQ-8B Fire Scout VTUAV and an MH-60R with MK54 torpedoes.

The SUW MP increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes and move a force quickly through a choke point or other strategic waterway.

The SUW MP is comprised of several modules including the Gun Mission Module (GMM), the Aviation Module, the Maritime Security Module (MSM), and the Surface-to-Surface Missile Module (SSMM). The GMM is comprised of two high velocity 30mm cannons and is augmented with the ship's 57mm gun to counter close in to mid-range threats. The Aviation Module uses the embarked MH-60R helicopter with Hellfire missile and the MQ-8B Fire Scout VTUAV for the detection, identification, and classification of surface contacts and to engage long range threats. The MSM supports the embarkation of a Visit, Board, Search, and Seizure (VBSS) team. The SSMM will provide missile coverage for mid-range threats and small boats.

The LCS MM Common Equipment consists of enabling products required by all MPs to provide common hardware interfaces, computer operating environment, communications systems, aviation interface systems, and portable development & integration test-sets. Common hardware interfaces include definition, installation, and control of mechanical, electrical, and cooling requirements common to all mission packages. The Mission Package Computing Environment (MPCE) provides common services and Operating Environment to support all Mission Package Application Software and Open Architecture Products. The Multi-Vehicle Communications System (MVCS) enables the control and data exchange of simultaneous unmanned mission vehicles and the Seaframes. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. Development and integration test-sets provide a mobile operating environment installed in the Mission Package Portable Control Stations (MP-PCS) to serve as a surrogate Seaframe during mission package development and integration test events at test ranges.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Mine Countermeasures (MCM) Mission Package	31.526	45.355	21.852	0.000	21.852
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total

FY 2016 Accomplishments:

For the Remote Minehunting (RMH), Near Surface Detection (NSD), and Airborne Mine Neutralization (AMN) Modules, the program resolved hardware Problem Trouble Reports (PTRs) and Trouble Observation Reports (TORs) identified during MCM MP TECHEVAL through development of Advanced Change Study Notices (ACSNs) and Engineering Change Proposals (ECPs).

For the MCM MP Coastal Mine Reconnaissance (CMR) Module, integrated COBRA Post Mission Analysis (PMA) workstation into the Mission Package Computing Environment (MPCE) rack and conducted shore side integration events in Mission Package Integration Lab (MPIL) and on LCS. Integrated COBRA software into the MCM Mission Package Application Software (MPAS). Conducted CMR Module Critical Design Review (CDR) and completed development and issued CMR Module specifications. Commenced development of MCM CMR Module logistic products (drawings, Combat System Operating Sequence Systems (CSOSS), Interactive Electronic Technical Manuals (IETMs), Maintenance Requirement Cards (MRCs)). Developed CMR Module Test Objectives and initial Design Reference Mission Profile (DRMP).

For the MCM MP Unmanned Mine Sweep (UMS) and Buried Minehunting (BMH) Modules, completed development of the Unmanned Influence Sweep System (UISS) EDM and support contractor testing of the Knifefish Unmanned Underwater Vehicle (UUV). Developed the UMS Module and BMH Module specifications and developed the DRMP. Conducted Knifefish support container Preliminary Design Review, Detailed Design Review, and Integrated Design Review. Developed preliminary Support Container drawings. Developed and tested the Knifefish support container.

In support of MCM MP, incorporated the following items into MCM MPAS build 1.7: Correction of software PTRs identified during MCM MP TECHEVAL, integration of MEDAL EA and COBRA software and upgrade MPAS Operating Systems to maintain Information Assurance (IA) compliance. Performed systems engineering (risk management, information assurance, human systems integration, safety), configuration management, and Integrated Logistics Support. Provide collection capability for MP environmental data.

FY 2017 Plans:
MCM MP NSD and AMN Modules (ALMDS, AMNS, MH-60S): Support the declaration of IOC for the MCM aviation systems in Q1 FY2017.

MCM MP RMH Module (MCM-USV, and AN/AQS-20 Minehunting sonar): Continue the implementation of Independent Review Team recommendations.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
MCM MP CMR Module (VTUAV, COBRA): Prepare to conduct operational testing of VTUAV/COBRA to support delivery of beach zone mine detection capability in FY 2018 . MCM MP UMS Module (UISS = MCM-USV + US3): Complete integration of UISS into MCM MP and prepare for developmental testing on an LCS platform. For MCM MP BMH Module (Knifefish): Conducted Knifefish Line Mapping Test on USS Independence variant hull. Initiate integration of Knifefhish into MCM MP to include launch and recovery testing from an LCS platform. Continue development of training and training systems for MCM detachments in accordance with Navy Training Support Plan (NTSP). Begin to incorporate UISS and Knifefish into delivered training courses. Perform vendor and interim training in preparation for FY18 deployment. Fund training related detachment Sailor travel for vendor and interim formal training in accordance with Crew Sequencing and Phasing Plans. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Continue analysis of MCM training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify KPP. Pilot MCM CAPSTONE Mission Planner, and PMA courses. Achieve Ready for Training (RFT) of MCM CAPSTONE Mine Warfare (MIW), Remote Vehicle Operator (RVO) and Remote Sensor Operator (RSO), Mission Planner, and PMA courses. Pilot and achieve RFT of LCS Common Skills course, and LCS MCM Skills course in the Mission Bay Trainer (MBT) at LCS Training Facility (LTF). Deliver Common Mission Package Trainer software (initial capabilities variant) to the LTF. MCM Train to Certify (T2C) capability will be achieved in FY22 after all systems have been delivered, trainers in place and formal training has been developed and accepted. In support of MCM MP, incorporate the following items into MCM MPAS: Correction of software PTRs identified during MCM MP testing, and UISS software and upgrade MPAS operating systems to maintain IA compliance. Perform systems engineering (risk management, information assurance, human systems integration, safety), configuration management and integrated logistics support. *FY 2018 Base Plans:* MCM MP CMR Module (VTUAV, COBRA): Conduct DT/IT of VTUAV/COBRA on Independence variant and achieve IOC.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 *I* 4	**R-1 Program Element (Number/Name)** PE 0603596N *I (U)LCS Mission Modules*	**Project (Number/Name)** 3129 *I LCS Mission Package Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
MCM MP UMS Module (UISS = MCM USV + US3): Integrate MCM USV with AQS-20 and UISS into MCM MP and conduct DT and DT/IT on USS Independence variant hull. Start integration of UISS on Freedom variant and conduct LH&R and shipboard integration testing. MCM MP RMH Module (MCM-USV, and AN/AQS-20 Minehunting sonar): Continue integration of MCM USV with MVCS and PMA to support Minehunting. Post Mission Analysis (PMA) work station and application integration into a common equipment rack. In support of MCM MP, incorporate the following items into MCM MPAS build 3.0: Correction of software Problem Trouble Reports (PTRs) identified during MCM MP testing, and integration of Net-Centric Sensor Analysis for MIW (NSAM) and EPMA software. Perform systems engineering (risk management, information assurance, human systems integration, safety), configuration management and Integrated Logistics Support. Continue development of training and training systems for MCM detachments in accordance with NTSP. Continue incorporation of UMS and BMH Modules into delivered training courses. Perform vendor and interim training to support deployed MCM MP and the MCM Minehunting Platform Decision. Fund training related detachment Sailor travel for vendor and interim formal training in accordance with Crew Sequencing and Phasing Plans (CSPP). Continue analysis of MCM training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify (T2C) Key Performance Parameter (KPP). Begin development of MCM Common Mission Package Trainer software with UMS and BMH Module functionality. *FY 2018 OCO Plans:* N/A					
Title: Anti-Submarine Warfare (ASW) Mission Package *Articles:*	56.289 -	29.541 -	49.868 -	0.000 -	49.868 -
FY 2016 Accomplishments: Conducted reliability testing of the ASW mission system components and commenced test planning for ASW MP DT, TECHEVAL and IOT&E on LCS 1 variant. Developed testing objectives, conducted performance prediction modeling and prepared test plans to support the start execution of an ASW MP developmental testing in FY17.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Oversaw and supported execution of shipboard industrial work in accordance with ASW MP Ship Alteration Permanent Change (SHIPALT/PC) Technical Data Package (TDP) and the additional mission module installation Engineering Change Proposals (ECPs). Closed out the Preliminary Design Review (PDR) for the ASW MP Engineering Development Model (EDM) (with weight reduction) by completing engineering efforts to resolve and adjudicate Request for Actions (RFAs). Completed development of the TDP for the ASW MP Critical Design Review (CDR) planned for FY17. Completed development of a draft ASW MP Capabilities Production Document (CPD) and provided engineering, modeling, and analysis support to OPNAV as CPD is staffed though JROC review and approval process. Continued management of PEO LCS Rapid Technology Insertion (RTI) initiative Phase II (Escort Mission Module (EMM)) and completed procurement of Pre-Production Test Article and integration to support continuation of Phase II component and system level validation testing and ASW MP / Ship integration. Continued to develop final ship integration approaches to support LCS Ship Alteration Permanent Change (SHIPALT/PC) TDP development. Completed Light Weight Tow (LWT) torpedo countermeasure mission module wet end and system control software development. Completed procurement of test assets and acquired necessary test spares to support ship integration. Continued planning for development of training and training systems for ASW Mission Module detachments in accordance with Navy Training Support Plan (NTSP). Performed vendor and interim training for ASW developmental test events. Funded training related detachment and replacement Sailor travel for vendor and interim formal training in accordance with Crew Sequencing and Phasing Plans. Continued initial LCS ASW training using SQQ-89 courses, NUWC Land Based Integration Test (LBIT) facility, and NAVAIR Ship Aircraft Integration Laboratory (SAIL). *FY 2017 Plans:* Continue EMM development and production of the pre-production test article. Conduct the EMM design reviews and feasibility testing to verify performance.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct mission module and mission package level LBIT, end-to-end (E2E) integration testing, including events at PAX RIVER SAIL for Aviation integration, Combat Management System (CMS) integration, and performance validation testing in support of ASW MP TECHEVAL. Continue planning for ASW MP IOT&E. Support EDM Lightweight Tow/LCS integration. Prepare Modular Testing Vehicle (MTV) torpedoes to support in-water testing of integrated Support Lightweight Tow DT/OT at Canadian Fleet Maritime Experimental Testing Range (CFMETR). Award AN/SLQ-61 LRIP contract. Continue development of training and training systems for ASW Mission Module detachments in accordance with NTSP. Update ASW Front End Analysis (FEA) and Job Duty Task Analysis (JDTA) to reflect ASW Rapid Technology Insertion (RTI) system selection. Perform vendor and interim training for ASW developmental test events. Fund training related detachment Sailor travel for program test events and Crew Sequencing and Phasing Plan (CSPP) required training. Begin development of formal curriculum and incorporate findings from program test events, operations and classroom experience. Continue analysis of training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify (T2C) Key Performance Parameter (KPP). Continue development of ASW Training and trainers. Continue initial LCS ASW training using SQQ-89 courses, NUWC Land Based Integration Test facility (LBIT), and NAVAIR Ship Aircraft Integration Laboratory (SAIL). Commence development of Common Mission Package Trainer (CMPT) ASW software for use in LCS ASW MM CAPSTONE courses at LCS Training Facility (LTF). SUW Train to Certify (T2C) capability will be achieved in FY20 after all systems have been delivered, trainers in place and formal training has been developed and accepted. Continue Escort Mission Module acoustic processing, Aviation integration support software and Command and Control software development to support software certification and follow on shipboard testing. Initiate safety analysis of the ASW EDM systems developed under the RTI initiative and conduct integration safety analyses on the Independence variant. *FY 2018 Base Plans:* Complete EMM development. Exercise the integration and testing CLIN on the RTI contract in support of ship or Mission Module integration, testing, Validation and Verification (V&V), certification and delivery. Finalize safety analysis of the ASW systems for risk of production equipment. Continue detailed integration safety analyses on the Independence variant. Participate in ASW MP test events on board Freedom and					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Independence Variants in order to verify safety requirements. Conduct ASW MP Weapon System Explosives Safety Review Board (WSESRB) for concurrence with ASW MP deployment. Finalize FY19 testing objective for the Performance Prediction modeling and conduct ASW MP level end-to-end (E2E) integration testing at the Land Based Integration Test (LBIT) facility and start performance validation testing in support of ASW MP TECHEVAL/OPEVAL. Support ASW Escort Mission Module (EMM) shipboard mods on Independence variant in preparation for MP embarkation and DT. Work with shipbuilder to ensure work packages are developed and approved for execution in FY18. Develop FY19 testing objectives, conduct performance prediction modeling and prepare test plans to support the execution of an ASW MP operational testing of the ASW MP. Conduct Integration testing of AN/SLQ-61 on LCS Freedom variant. Testing to be performed aboard LCS platforms at the Canadian Fleet Maritime Experimental Testing Range (CFMETR) against instrumented MTV torpedoes. While at CFMETR conduct ship radiated noise measurement testing, and wake profiling. Integration Test facility (LBIT), and NAVAIR Ship Aircraft Integration Laboratory (SAIL). Deliver initial Common Mission Package Trainer (CMPT) ASW software for LCS ASW MM CAPSTONE courses. Train to Certify (T2C) capability will be achieved in FY20 after all systems have been delivered, trainers in place and formal training has been developed and accepted. Develop the production transition plan and conduct factory acceptance testing at the Contractor facility of the Pre-Production Test Article. *FY 2018 OCO Plans:* N/A					
Title: Surface Warfare (SUW) Mission Package *Articles:*	56.460 -	42.552 -	17.647 -	0.000 -	17.647 -
FY 2016 Accomplishments: Conducted reliability testing of the Surface-to-Surface Missile Module (SSMM).					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continued developmental testing to categorize modifications to the current MPAS baseline. Continued modifications to MPAS to support SSMM development. Completed planning and executed the SSMM environmental confidence level testing. Executed engineering and developmental testing of SSMM. Continued development of the detailed launcher design that supports the SSMM concept. Find/Fix/Repair technical issues associated with SSMM and MPAS identified during STF and DT events. Continued development of training and training systems for SUW Mission Module detachments in accordance with Navy Training Support Plan (NTSP). Performed vendor and interim training for formal SUW test events. Funded training related detachment and replacement Sailor travel for vendor and interim formal training in accordance with Crew Sequencing and Phasing Plans (CSPP). Updated formal curriculum to incorporate findings from program test events, operations and classroom experience. Piloted SUW CAPSTONE Mission Package Coordinator (MPC) and Gun Console Operator (GCO) courses. Piloted and achieved Ready for Training for MK50 Gun Mission Module (GMM) Operations and Maintenance differences course. Continue analysis of SUW training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify (T2C) Key Performance Parameter (KPP). **FY 2017 Plans:** Complete development and subsystem validation testing of the Surface-to-Surface Missile Module (SSMM) in support of a Technical Data Package (TDP) delivery for production in FY18. Complete software modifications and safety assessments for vertical launch integration of the Longbow Hellfire (LBHF) missile into the SSMM. Complete delivery of Engineering Development Models to support formal shipboard testing aboard Freedom and Independence Class. Continue development of Mission Package Application Software (MPAS) with Helo Support Function (HSF) to include VTUAV software integration and deliver MPAS Build 2.4.4 to support formal shipboard DT/IT and IOT&E on Freedom and Independence variants in FY17/FY18. Support development of SSMM logistics documentation and conduct initial crew training for shipboard test events and FY18 deployments. Conduct SSMM Critical Design Review (CDR). Develop FMECA to the functional level to support the SFR with updates to the system level for Preliminary Design Review and to the LRU/SRU level for CDR. Level of Repair Analysis modeling to support PDR with an update for CDR. Mission Module Maintenance Plan to be delivered as a Maintenance Concept report for PDR with a complete plan covering Organizational-Level maintenance only to support CDR. Maintenance Task Analysis (MTA) as required to identify O-level maintenance requirements. Detail Task Analysis (DTA) as required to outline and analyze each identified O-level maintenance task. Support Equipment Requirements Documents (SERDs) to document common and unique support equipment requirements for O-					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
level identified during task analysis. O-level Technical Manual development utilizing the output of supportability and maintenance analysis tasks, hardware engineering drawings and specifications, and any existing technical documentation. These manuals must be compatible with and consistent in style, content, and format to the existing SUW technical manuals. Continue update of SUW Supportability Assessment and Gap Analysis Reports on an annual basis. Provide initial provisioning technical data at sufficient level to support O-level deployed maintenance activities. Develop SUW MP PMS to include SSMM equipment. Conduct combat system certification, MP certification, obtain WSESRB/SSSTRP approvals, and IA approvals for initiation of Developmental testing. Conduct SSMM Structural Test Fire (STF) onboard Freedom Variant. Begin Developmental Testing on Freedom Variant. Complete all Integrated Logistics Support (ILS) products in support SSMM IOC. Deliver all Interactive Electronic Technical Manuals (IETM) to support SSMM normal and casualty modes, and SSMM installation and employment. Complete and deliver all Maintenance Requirements Cards (MCR). Conduct ILS certification. Deliver all Provisioning Documentation to include Allowance equipage Lists (AEL) and Allowance Parts Lists (APLs). Procure all testing spares required to support SUW Increment III TECHEVAL and IOT&E. Continue development of training and training systems for SUW Mission Module detachments in accordance with NTSP. Perform vendor and interim training for formal SUW test events. Fund training related detachment Sailor travel for vendor and interim formal training in accordance with CSPPs. Update formal curriculum to incorporate findings from program test events, operations and classroom experience. Continue analysis of SUW training to validate effective training delivery and identify changes necessary to deliver training that will achieve Train to Certify KPP. Begin development of SUW Skills training for use at LTF Mission Bay Trainer. Develop curriculum and system changes to support incremental capability fielding plan. Begin integration of VTUAV into SUW MP MPAS. *FY 2018 Base Plans:* Complete formal shipboard testing (DT/IT, IOT&E) aboard Freedom Class only. Conduct post-test Find, Fix, and Repair (FFR) of SSMM assets and resolve Mission Package Application Software (MPAS) Computer Change Program Requests (CPCR).					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Finalize SSMM logistics documentation and conduct crew training for shipboard test events and deployment. Complete delivery of the Surface-to-Surface Missile Module (SSMM) Technical Data Package (TDP) to support transition to production and Production Readiness Review (PRR). Perform vendor and interim training for formal SUW test events. Update formal curriculum to incorporate findings from test events, operations and classroom experience. Begin development of SUW Skills training for use at LTF Mission Bay Trainer. Develop curriculum and system changes to support incremental capability fielding plan. *FY 2018 OCO Plans:* N/A					
Title: Command, Control, Communication, Computers, Collaboration and Intelligence (C5I) *Articles:*	9.639 -	8.554 -	10.082 -	0.000 -	10.082 -

FY 2016 Accomplishments:
MPCE v1.9 - Continued hardware tech refresh activities at MP development sites and ship set deliveries for ships in accordance with Ship Project Directives (SPDs); - MPS/MPOE, Developed new software release of MPS/MPOE for MPAS integration on as required basis. Continued integration of Common Software Architecture (CSA) into the ASW MP. Continued evolving the MPCE software architecture to a Service Oriented Architecture (SOA), MPCE 1.9.x. Completed MPCE 1.9.x System Subsystem Spec (SSS) documenting the merge of CSA SSS requirements with the MPCE SSS. Conducted tech refresh/insertion studies needed to sustain incremental MPCE capability upgrades. Identified technology refresh cycles and the hardware required to meet current requirements while addressing obsolescence and future MPCE SSS requirements. MVCS v1.2.0, develop software changes to support UISS and SMCM UUV integration and complete definition of requirements to integrate High Frequency Ground Wave (HFGW) radio.

Common Mission Package Trainer (CMPT). Completed MCM Increment 1 and SUW increment 1 integration with LCS-1 and LCS-2 Combat Management System Trainers and commenced standalone and integrated team training at LTF for MCM and SUW detachments. Prepared CMPT development lab for transition to MPCE 1.9 hardware specification and transition to Windows 10 software to meet cyber-security requirements.

FY 2017 Plans:
Mission Package Computing Environment
Conduct tech refresh of MPCE 1.9 hardware in support of continuing Mission Module developmental efforts. Conduct MPCE groom and TOR remediation activities to support shipboard testing of MCM and SUW Mission Modules (Freedom Variant).

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Common Mission Package Trainer (CMPT). Continue incremental update to reflect MCM CMR capability and SUW SSMM capability. Integrate updated software with LCS-1 and LCS-2 Combat Management System Trainers and conduct standalone and integrated team training at LTF for MCM and SUW detachments. Transition CMPT development lab to MPCE 1.9 hardware specification and Windows 10 software to meet cyber-security requirements. Prepare CMPT Development lab for transition to ASW Escort Mission Module (EMM) hardware and software specifications. *FY 2018 Base Plans:* Mission Package Computing Environment: Conduct MPCE Modernization, conduct Formal SETR MPCE 1.9.x CDR and Factory Training. Conduct MPCE grooms to support MCM, ASW and SUW MP Test events. Complete transition to the common software baseline from MPOE/MPS with MCM, SUW, and ASW. Develop an Unmanned System Common Control to control UISS and monitor Knifefish. Finalize Program Protection Plan. Conduct Logistics Demonstration (LOGDEMO) to validate the effectiveness and execution performance of the delivered logistics products. Multi Vehicle Communications System: Complete the design, development and test of MVCS 1.3, resulting in an ECP and SCD package. Conduct tech refresh/insertion studies needed to sustain incremental MVCS capability upgrades. Support integration of the communication package into Knifefish and UISS. Perform technical upgrade of MVCS 1.1 and 1.2 Provide assistance for Knifefish, UISS, and MCM-USV upgrades required for MVCS. Continue development of logistics products for MVCS 1.3 Common Mission Package Trainer (CMPT). Continue incremental update to reflect MCM CMR capability and SUW SSMM capability. Integrate updated software with LCS-1 and LCS-2 Combat Management System Trainers and conduct standalone and integrated team training at LTF for MCM and SUW detachments. Transition CMPT development lab to include ASW Escort Mission Module (EMM) hardware and software specification. *FY 2018 OCO Plans:*					

Exhibit R-2A, **RDT&E Project Justification:** FY 2018 Navy		**Date:** May 2017
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
N/A					
Title: System Engineering and Program Acquisition	34.958	34.056	17.422	0.000	17.422
Articles:	-	-	-	-	-

FY 2016 Accomplishments:
Overarching SE
Continued to Develop and implement process to track lead/lag SE Metrics to include requirements, RTVM, and SRLs
Continued to implement a Technical Performance Measure (TPM) Plan,
Continued to Assist in TOR adjudication and prioritization
Continued to Standardized and improved Reliability, Availability and Maintainability (RAM) data collection
Continue to Implement the

Maintained Failure Reporting, Analysis, and Corrective Action System(FRACAS) and Failure Review Boards (FRBs) Modeling and Simulation strategic plan to support performance prediction, validation of Test & Evaluation plans, and/or training and stimulation and simulation efforts.

Configuration Management: Continued to implement the Configuration Management Plan (CMP) to differentiate between developmental and product baselines and look to streamline CCB processes
Safety/ESOH risk/hazard analysis and mitigation tracking
Conducted Safety Risk Assessment of new development technologies such as Common Software Architecture (CSA)
Continued to implement the Hazardous Materials Management Plan (HMMP)

Reliability, Maintainability, and Availability
Continued the systematical management and elimination of failures and failure modes through identification, classification, analysis and removal or mitigation. Continued the refinement of the MCM, SUW and ASW RAM models by integration actual data collected during mission package TECHEVAL, Initial Operational Test and Evaluation (IOT&E) and Fleet operations and conduct multiple sensitivity analysis to quantify the effect of alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Conducted root cause analysis and recommended corrective action on all discovered failure modes. Continued utilizing FRACAS to feedback MCM, SUW and ASW product and process improvements to the Systems Engineering and ILS organizations. Drafted RAM-C Analysis Reports for new and updated analysis. Updated RAM-C Rationale Report as required to reflect the new and updated analysis.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Test and Evaluation Continued planning and executing the LCS Mission Module test program. This included additional planning, testing, data analysis, and reporting for the missile in a module to be installed in LCS weapons zone. Conduct National Environmental Policy Act (NEPA) and environmental planning and coordination to support DT/ TECHEVAL/OT/FOTE. Conduct and Support Certification Test and Evaluation to include software certification/ assessment testing, reporting, and events such as MPRAs, MRAs, MRRs, Test Readiness Reviews, WSESRB, etc. in order to support test events and Fleet deployment upon completion of the IOT&E. Perform Mission Package - Seaframe Integration and Aviation Integration. Seaframe Integration provided services that supported the successful integration of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Aviation Integration provided services that supported the successful integration of aviation assets of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. *FY 2017 Plans:* Continue PM efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives that are not associated with specific hardware elements. Continue to provide overarching System Engineering oversight for all LCS Mission Modules. Continued to Develop and implement process to track lead/lag SE Metrics to include requirements, RTVM, and SRLs, continue iplementation of Technical Performance Measure (TPM) plans and continue to implement Model Based System Engineering strategies on critical MP interfaces identified during ASW SFR and SSMM assessments. Continue to assist in TOR adjudication and prioritization. Continue to Implement the Failure Reporting, Analysis, and Corrective Action System (FRACAS) and Failure Review Boards (FRBs) Supported the following Major SE Events: Buried Minehuting Mission Module PDR and CDR, Unmanned Mine Sweeping Mission Module PDR and CDR, Full MCM MP Capability System Requirements Review (SRR), and SUW MP SSMM CDR. Continue the systematical management and elimination of failures and failure modes through identification, classification, analysis and removal or mitigation. Continue the refinement of the MCM, SUW and ASW RAM models by integrating actual data collected during mission package TECHEVAL, Initial Operational Test and Evaluation (IOT&E) and Fleet operations and conduct multiple sensitivity analysis to quantify the effect of					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Conduct root cause analysis and recommend corrective action on all discovered failure modes. Continue utilizing FRACAS to feedback MCM, SUW and ASW product and process improvements to the Systems Engineering and ILS organizations. Provide shipboard Integration services that supported the successful integration of the MCM, and SUW Mission Packages into both variants of LCS seaframes. Aviation Integration provide services that support the successful integration of aviation assets of the MCM, SUW, and ASW Mission Packages into both variants of LCS seaframes. Training Management Coordinate efforts of four training Integrated Project Teams (IPTs): MCM, SUW, ASW, and Common systems. Developed programmatic documentation updates for Cost Analysis Requirements Document (CARD), Manpower Estimate Report (MER), and Three NTSPs: MCM, ASW and SUW. Continue to integrate LCS MM program training with LCS platform program training, and support Surface and Expeditionary Warfare Training Council (SEWTC) periodic training execution review and annual POM issue prioritization. *FY 2018 Base Plans:* Continue PM efforts: business and administrative planning, organizing, directing, coordinating, controlling, and approval actions designated to accomplish overall program objectives that are not associated with specific hardware elements. Continue to provide overarching System Engineering oversight for all LCS Mission Modules. Continue to Develop and implement process to track lead/lag SE Metrics to include requirements, RTVM, and SRLs, continue implementation of Technical Performance Measure (TPM) plans and continue to implement Model Based System Engineering strategies on critical MP interfaces identified during ASW SFR and SSMM assessments. Continue to assist in TOR adjudication and prioritization. Continue to Implement the Failure Reporting, Analysis, and Corrective Action System (FRACAS) and Failure Review Boards (FRBs) Reliability, Maintainability, and Availability Continue the systematical management and elimination of failures and failure modes through identification, classification, analysis and removal or mitigation. Continue the refinement of the MCM, SUW and ASW RAM models by integrating actual data collected during mission package TECHEVAL, Initial Operational Test and Evaluation (IOT&E) and Fleet operations and conduct multiple sensitivity analysis to quantify the effect of					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
alternate sparing philosophies (i.e., more onboard spares, complete spare system, etc.) based on mission module availability. Conduct root cause analysis and recommend corrective action on all discovered failure modes. Continue utilizing FRACAS to feedback MCM, SUW and ASW product and process improvements to the Systems Engineering and ILS organizations. Draft RAM-C Analysis Reports for new and updated analysis. Update RAM-C Rationale Report as required to reflect the new and updated analysis. Perform RAM modeling at the module level to support requirements development for OPNAV CPDs, as required. Support VV&A efforts and ad hoc analysis, as directed. Integrating SUW SSMM on Freedom variant to support DT event; Integrating MCM MP UMS on INDY variant in support of DT event; MPAS-CMS Integration Testing at DIF & MSIC; Conducting Seaframe feasibility studies with both shipbuilders for ASW, MCM and SUW MP Integration; .MSSIT Test Kit Development for Aviation and Mission Package Interfaces; Common Software Architecture Integration; MPCE v1.9 INCOs on new ships; and Maintain ICD 2.0 and IDS Next Configuration Management. Training Management Coordinate efforts of four training Integrated Project Teams (IPTs): MCM, SUW, ASW, and Common systems. Develop programmatic documentation updates for Cost Analysis Requirements Document (CARD), Manpower Estimate Report (MER), and Three NTSPs: MCM, ASW and SUW. Continue to integrate LCS MM program training with LCS platform program training, and support Surface and Expeditionary Warfare Training Council (SEWTC). ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	188.872	160.058	116.871	0.000	116.871

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 1600: *LCS Common Mission Modules Equipment*	23.061	27.840	34.666	-	34.666	29.388	30.221	24.282	24.666	Continuing	Continuing
• 1601: *LCS MCM Mission Modules*	67.451	57.146	55.870	-	55.870	73.903	75.373	158.293	188.844	Continuing	Continuing
• 1602: *LCS ASW Mission Modules.*	0.000	31.952	0.000	-	0.000	82.188	54.553	90.354	61.808	Continuing	Continuing
• 1603: *LCS SUW Mission Modules*	35.228	22.466	52.960	-	52.960	56.556	30.093	12.454	42.929	Continuing	Continuing

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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 1605: *Remote Minehunting System (RMS)*	53.077	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• 4221: *LCS Module Weapons*	0.000	2.776	13.110	-	13.110	13.628	13.424	13.701	13.977	Continuing	Continuing

Remarks

D. Acquisition Strategy

The LCS Mission Module Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

E. Performance Metrics

Program Completed Milestone B January 2014
Conducted the SUW MP TECHEVAL/IOT&E aboard LCS 1 variant
Conducted SUW MP DT, TECHEVAL and IOT&E on LCS 2 variant
MCM Minehunting Platform Decision
Conduct ASW IOT&E on LCS 1 and 2 variants
Conduct MCM MP TECHEVAL/IOT&E

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy												Date: May 2017	

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
6.1 System Engineering	C/CPFF	AAC : Uniontown, PA	0.637	0.000		0.000		0.000		-		0.000	0.000	0.637	-
6.1 System Engineering	C/CPFF	CACI : Fairfax, VA	1.147	1.921	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.1 System Engineering	C/CPFF	ESS-TBD : Washington, DC	0.000	0.000		1.031	Dec 2016	0.129	Nov 2017	-		0.129	0.000	1.160	-
6.1 System Engineering	C/CPFF	Lockheed Martin : Riviera Beach, FL	1.233	1.233	Dec 2015	0.000		0.000		-		0.000	0.000	2.466	-
6.1 System Engineering	WR	NAVSEALOGCEN : Norfolk, VA	0.000	0.731	Nov 2015	0.620	Dec 2016	0.369	Dec 2017	-		0.369	0.000	1.720	-
6.1 System Engineering	C/CPFF	Northrop Grumman : Bethpage, NY	6.558	2.652	Dec 2015	4.225	Dec 2016	1.020	Feb 2018	-		1.020	Continuing	Continuing	Continuing
6.1 System Engineering	WR	NSWC Carderock : Bethesda, MD	1.130	0.400	Nov 2015	1.000	Nov 2016	0.000		-		0.000	0.000	2.530	-
6.1 System Engineering	WR	NSWC PHD : Port Hueneme, CA	0.765	0.343	Feb 2016	0.350	Jan 2017	0.000		-		0.000	0.000	1.458	-
6.1 System Engineering	WR	SPAWAR PAC : San Diego, CA	4.431	1.500	Jan 2016	1.500	Dec 2016	0.750	Dec 2017	-		0.750	Continuing	Continuing	Continuing
6.1 System Engineering	C/CPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		0.000		0.810	Jan 2018	-		0.810	0.000	0.810	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	CACI : Fairfax, VA	0.950	0.950	Jan 2016	0.000		0.000		-		0.000	0.000	1.900	-
6.4 Integration, Assembly, Test and Checkout	Sub Allot	CECOM Bldg 1207 : Various	0.367	0.475	Jan 2016	0.250	Feb 2017	0.000		-		0.000	0.000	1.092	-
6.4 Integration, Assembly, Test and Checkout	WR	NAWC AD : Patuxent River, MD	0.000	0.300	Oct 2015	0.950	Mar 2017	0.000		-		0.000	0.000	1.250	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	Northrop Grumman : Bethpage, NY	0.673	0.575	Dec 2015	0.250	Jan 2017	0.325	Dec 2017	-		0.325	0.000	1.823	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC Carderock : Bethesda, MD	6.677	0.300	Nov 2015	1.000	Dec 2016	1.492	Jan 2018	-		1.492	0.000	9.469	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC Crane : Crane, Indiana	1.613	0.280	Nov 2015	0.000		0.000		-		0.000	0.000	1.893	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC PHD : Port Hueneme, CA	0.658	0.320	Dec 2015	0.225	Jan 2017	0.350	Nov 2017	-		0.350	0.000	1.553	-

Exhibit R-3, **RDT&E Project Cost Analysis:** FY 2018 Navy														**Date:** May 2017	

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Product Development ($ in Millions)				**FY 2016**		**FY 2017**		**FY 2018 Base**		**FY 2018 OCO**		**FY 2018 Total**			
Cost Category Item	**Contract Method & Type**	**Performing Activity & Location**	**Prior Years**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Award Date**	**Cost**	**Cost To Complete**	**Total Cost**	**Target Value of Contract**
6.4 Integration, Assembly, Test and Checkout	WR	SPAWAR PAC : San Diego, CA	0.000	0.580	Dec 2015	0.750	Jan 2017	0.750	Feb 2018	-		0.750	Continuing	Continuing	Continuing
6.4 Integration, Assembly, Test and Checkout	WR	SUPSHIP Bath : Bath, ME	0.000	1.495	Mar 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.4 Integration, Assembly, Test and Checkout	WR	SUPSHIP Gulfcoast : Pascagoula, MS	0.000	2.500	Jan 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.4 Integration, Assembly, Test and Checkout	WR	NAVAIR : Lakehurst	0.000	0.000		0.200	Mar 2017	0.325	Dec 2017	-		0.325	0.000	0.525	-
6.4 Integration, Assembly, Test and Checkout	C/CPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		0.525	Jan 2017	0.500	Jan 2018	-		0.500	0.000	1.025	-
4.0 Common Equipment Development	C/CPFF	AAC : Uniontown, PA	3.053	5.201	Jan 2016	4.707	Feb 2017	2.650	Mar 2018	-		2.650	0.000	15.611	-
4.0 Common Equipment Development	WR	NAWC TSD : Orlando, FL	0.000	0.750	Mar 2016	0.000		0.354	Jan 2018	-		0.354	0.000	1.104	-
4.0 Common Equipment Development	C/CPFF	Northrop Grumman : Bethpage, NY	1.128	0.350	Jan 2016	0.544	Dec 2016	0.575	Feb 2018	-		0.575	Continuing	Continuing	Continuing
4.0 Common Equipment Development	WR	NSWC DD : Dahlgren, VA	0.904	0.600	Oct 2015	0.438	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
4.0 Common Equipment Development	WR	NSWC PC : Panama City, FL	4.322	0.000	Oct 2015	4.425	Nov 2016	4.813	Dec 2017	-		4.813	Continuing	Continuing	Continuing
4.0 Common Equipment Development	WR	NUWC NPT : Newport, RI	0.622	0.550	Oct 2015	0.402	Dec 2016	0.500	Nov 2017	-		0.500	Continuing	Continuing	Continuing
4.0 Common Equipment Development	WR	PMW 760 : Various	0.478	0.238	Feb 2016	0.173	Jan 2017	0.000		-		0.000	0.000	0.889	-
4.0 Common Equipment Development	C/CPFF	Progeny : Manassas, VA	0.000	1.000	Jan 2016	0.730	Mar 2017	0.000		-		0.000	0.000	1.730	-
4.0 Common Equipment Development	TBD	SBIR : Various	0.000	0.000	Mar 2016	0.000		0.000		-		0.000	0.000	0.000	-
4.0 Common Equipment Development	WR	SPAWAR PACIFIC : San Diego, CA	1.155	0.950	Dec 2015	0.694	Dec 2016	0.710	Jan 2018	-		0.710	0.000	3.509	-
4.0 Common Equipment Development	C/CPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		1.121	Dec 2016	0.480	Dec 2017	-		0.480	0.000	1.601	-

| Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy | | | | | | | | | | | | | Date: May 2017 | |

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
1.0 MCM MP	C/CPFF	Northrop Grumman : Bethpage, NY	0.000	0.745	Nov 2015	0.544	Dec 2016	0.000		0.000	-	0.000	0.000	1.289	-
1.0 MCM MP	WR	NSWC Corona : Corona	0.000	0.571	Nov 2015	0.544	Jan 2017	0.000		0.000	-	0.000	0.000	1.115	-
1.0 MCM MP	WR	NSWC PC : Panama City, FL	19.704	13.810	Oct 2015	29.846	Nov 2016	17.492	Dec 2017		-	17.492	Continuing	Continuing	Continuing
1.0 MCM MP	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.000		0.000			-	0.000	0.000	0.000	-
1.0 MCM MP	MIPR	PM266 : Pax Rive, MD	0.000	0.400	Mar 2016	0.407	Mar 2017	0.000			-	0.000	0.000	0.807	-
1.0 MCM MP	Sub Allot	PMS 406 : Various	11.861	16.000	Jan 2016	11.000	Mar 2017	3.900	Nov 2017		-	3.900	0.000	42.761	-
1.0 MCM MP	Sub Allot	PMS 495 : Various	0.000	0.000		0.000		0.460	Feb 2018		-	0.460	0.000	0.460	-
1.0 MCM MP	MIPR	PMW 760 : San Diego, CA	0.000	0.000		0.173	Jan 2017	0.000			-	0.000	0.000	0.173	-
1.0 MCM MP	C/CPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		0.000		0.000			-	0.000	0.000	0.000	-
1.0 MCM MP	C/CPFF	PMS 501 : Washington, DC	0.000	0.000		0.000		0.000			-	0.000	0.000	0.000	-
2.0 ASW MP	C/CPFF	CACI : Arlingrton, VA	0.343	0.258	Jan 2016	0.000		0.000			-	0.000	0.000	0.601	-
2.0 ASW MP	WR	CDSA Dam Neck : Virginia Beach, VA	1.389	3.723	Oct 2015	4.775	Dec 2016	1.248	Nov 2017		-	1.248	0.000	11.135	-
2.0 ASW MP	Sub Allot	RTI Contractor : Various	2.568	28.800	Jan 2016	2.500	Mar 2017	16.188	Jan 2018		-	16.188	0.000	50.056	-
2.0 ASW MP	C/CPFF	Lockheed Martin : Various	0.000	0.000		3.307	Feb 2017	0.000			-	0.000	0.000	3.307	-
2.0 ASW MP	WR	NAWC WD : Point Mugu, CA	0.000	2.030	Jan 2016	3.000	Feb 2017	0.400	Mar 2018		-	0.400	0.000	5.430	-
2.0 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	1.647	3.500	Jan 2016	3.417	Dec 2016	2.376	Feb 2018		-	2.376	0.000	10.940	-
2.0 ASW MP	WR	NSWC DD : Dahlgren, VA	0.196	0.250	Nov 2015	0.000		0.425	Dec 2017		-	0.425	0.000	0.871	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy													Date: May 2017		

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Product Development ($ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
2.0 ASW MP	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.000		1.550	Nov 2017	-		1.550	0.000	1.550	-
2.0 ASW MP	WR	NUWC KPT : Keyport, WA	0.441	0.154	Nov 2015	0.000		0.950	Feb 2018	-		0.950	0.000	1.545	-
2.0 ASW MP	WR	NUWC NPT : Newport, RI	8.767	7.574	Oct 2015	7.422	Dec 2016	13.958	Nov 2017	-		13.958	0.000	37.721	-
2.0 ASW MP	Sub Allot	PEO IWS5 : Various	25.320	8.300	Jan 2016	4.870	Mar 2017	11.304	Dec 2017	-		11.304	0.000	49.794	-
2.0 ASW MP	C/CPFF	SPA : Washington, DC	0.587	0.600	Dec 2015	0.250	Jan 2017	0.250	Apr 2018	-		0.250	0.000	1.687	-
2.0 ASW MP	WR	SSC PAC : San Diego, CA	3.133	1.100	Dec 2015	0.000		0.718	Dec 2017	-		0.718	0.000	4.951	-
2.0 ASW MP	C/FPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		0.000		0.500	Dec 2017	-		0.500	0.000	0.500	-
3.0 SUW MP	C/CPFF	JAMS PO : Various	0.000	0.000		6.480	Feb 2017	1.500	Mar 2018	-		1.500	0.000	7.980	-
3.0 SUW MP	WR	NAWC WD : Ridgecrest, CA	5.826	2.000	Jan 2016	0.000		0.000		-		0.000	0.000	7.826	-
3.0 SUW MP	C/CPFF	Northrop Grumman : Bethpage, NY	26.681	15.883	Dec 2015	15.960	Dec 2016	2.000	Feb 2018	-		2.000	0.000	60.524	-
3.0 SUW MP	WR	NSWC CD : Crane, IN	0.196	0.200	Dec 2015	0.000		0.000		-		0.000	0.000	0.396	-
3.0 SUW MP	WR	NSWC Corona : Corona, CA	0.245	0.250	Nov 2015	0.250	Jan 2017	0.950	Jan 2018	-		0.950	0.000	1.695	-
3.0 SUW MP	WR	NSWC DD : Dahlgren, VA	20.711	17.308	Oct 2015	14.900	Nov 2016	7.397	Jan 2018	-		7.397	Continuing	Continuing	Continuing
3.0 SUW MP	WR	NSWC PHD : Port Hueneme, CA	9.137	13.500	Dec 2015	2.000	Jan 2017	5.800	Nov 2017	-		5.800	Continuing	Continuing	Continuing
3.0 SUW MP	Sub Allot	PEO IWS 3 : Various	0.000	7.319	Dec 2015	2.500	Feb 2017	0.000		-		0.000	0.000	9.819	-
		Subtotal	177.253	170.469		140.255		106.268		-		106.268	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4		**R-1 Program Element (Number/Name)** PE 0603596N / (U)LCS Mission Modules	**Project (Number/Name)** 3129 / LCS Mission Package Development

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
6.5 Training Systems Development	C/CPFF	CACI : Fairfax, VA	1.104	1.250	Jan 2016	0.000		0.000		-		0.000	0.000	2.354	-
6.5 Training Systems Development	WR	CNSF : San Diego, CA	1.104	0.900	Dec 2015	0.555	Jan 2017	0.000		-		0.000	Continuing	Continuing	Continuing
6.5 Training Systems Development	WR	JHU/APL : Laurel, MD	0.979	0.500	Feb 2016	0.000	Feb 2017	0.000		-		0.000	0.000	1.479	-
6.5 Training Systems Development	Sub Allot	Various : Various	0.000	1.520	Oct 2015	1.701	Mar 2017	0.443	Feb 2018	-		0.443	0.000	3.664	-
6.5 Training Systems Development	C/CPIF	Booz Allen Hamilton : Washington, DC	0.000	0.000		0.000		1.144	Dec 2017	-		1.144	0.000	1.144	-
		Subtotal	3.187	4.170		2.256		1.587		-		1.587	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
6.3 System Test and Evaluation	WR	NSWC PHD : Port Hueneme, CA	12.928	5.500	Dec 2015	7.820	Jan 2017	1.300	Nov 2017	-		1.300	0.000	27.548	-
6.3 System Test and Evaluation	WR	SPAWAR PAC : San Diego, CA	1.958	1.300	Jan 2016	2.000	Dec 2016	1.021	Dec 2017	-		1.021	0.000	6.279	-
6.3 System Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	1.694	1.300	Jan 2016	1.300	Mar 2017	1.294	Jan 2018	-		1.294	0.000	5.588	-
		Subtotal	16.580	8.100		11.120		3.615		-		3.615	0.000	39.415	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
6.2 Program Management	C/CPFF	CACI : Fairfax, VA	5.015	2.683	Jan 2016	0.000		0.000		-		0.000	0.000	7.698	-
6.2 Program Management	FFRDC	Mitre : McLean, VA	0.000	1.379	Nov 2015	1.300	Jan 2017	0.000		-		0.000	0.000	2.679	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy													Date: May 2017

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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
6.2 Program Management	C/CPFF	Northrop Grumman : Bethpage, NY	0.000	2.071	Nov 2015	1.440	Dec 2016	1.466	Feb 2018	-		1.466	0.000	4.977	-
6.2 Program Management	C/CPFF	NSWC Crane : Various	0.000	0.000		1.750	Dec 2016	1.177	Nov 2017	-		1.177	0.000	2.927	-
6.2 Program Management	C/CPIF	BAH : Washington DC	0.000	0.000		1.937	Nov 2016	2.758	Dec 2017	-		2.758	0.000	4.695	-
		Subtotal	5.015	6.133		6.427		5.401		-		5.401	0.000	22.976	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	202.035	188.872	160.058	116.871	-	116.871	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603596N / (U)LCS Mission Modules	**Project (Number/Name)** 3129 / LCS Mission Package Development

Proj 3129

FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022

MCM MP
- UISS / Knifefish PDR
- COBRA DT (IV)
- CMR DT / IT (IV)
- UISS / Knifefish CDR
- MCM USV LH&R (Phase 1)
- MCM USV LH&R (Phase 2)
- UISS LH&R
- UISS DT (IV)
- UISS DT/IT (IV)
- MCM MP DT Phase 1 (IV)
- MCM MP DT Phase 2 (IV)
- MCM MP DT Phase 3 (IV)
- MCM MP TECHEVAL (IV)
- MCM MP IOT&E (IV)
- BMH Integ (IV)
- MCM Integ (FV)

SUW MP
- SSMM PDR
- SSMM FIT (FV)
- SSMM STF (FV)
- SSMM DT/IT Phase 1 (FV)
- SSMM DT/IT Phase 2 (FV)
- SSMM TECHEVAL (FV)
- SSMM IOT&E (FV)

ASW MP
- PDR
- CDR/PRR
- PPTA Award
- Award Phase III
- Award Phase IV
- Procure Testing Spares
- MPAS/CMS Testing
- Install LWT
- LWT DT/IT Testing
- EMM DVT
- MPAS/CMS Testing
- V&V of VDS

Exhibit R-4, **RDT&E Schedule Profile:** FY 2018 Navy		**Date:** May 2017
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2018PB - 0603596N - 3129

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / (U)LCS Mission Modules	Project (Number/Name) 3129 / LCS Mission Package Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3129				
MCM MP: MCM MP UISS / Knifefish PDR	2	2017	2	2017
MCM MP: MCM MP UISS / Knifefish CDR	4	2017	4	2017
MCM MP: COBRA Mission System DT (Indy Variant)	2	2017	2	2017
MCM MP: MCM MP COBRA DT / IT (Indy Variant)	3	2017	3	2017
MCM MP: Launch, Handling, & Recovery Testing Phas 1 (MCM USV) (Indy Variant)	1	2017	3	2017
MCM MP: Launch, Handling, & Recovery Testing Phase 2 (MCM USV) (Indy Variant)	4	2017	4	2017
MCM MP: MCM MP UISS DT (Indy Variant)	2	2018	2	2018
MCM MP: MCM MP UISS DT/IT (Indy Variant)	4	2018	4	2018
MCM MP: MCM MP DT Phase I (Indy Variant)	1	2019	2	2019
MCM MP: MCM MP DT Phase 2 (Indy Variant)	3	2019	4	2019
MCM MP: MCM MP DT Phase 3 (Indy Variant)	1	2020	1	2020
MCM MP: MCM MP TECHEVAL (Indy Variant)	2	2020	3	2020
MCM MP: MCM MP IOT&E (Indy Variant)	4	2020	4	2020
MCM MP: Launch, Handling, & Recovery Testing Phas 1 (UISS) (Free Variant)	1	2018	1	2018
MCM MP: BMH (Knifefish) Integration (Indy Variant)	1	2021	4	2021
MCM MP: Start MCM Integration on Freedom	1	2022	4	2022
SUW MP: SUW MM SSMM PDR	2	2017	2	2017
SUW MP: Surface-to-Surface Missle Module Functional Integration Test (FIT) (Free Var)	1	2017	2	2017
SUW MP: SSMM Structural Test Fire (STF) (Free Var)	2	2017	2	2017
SUW MP: SSMM DT / IT Phase 1 (Free Var)	4	2017	1	2018
SUW MP: SSMM DT / IT Phase 2 (Free Var)	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy					Date: May 2017	
Appropriation/Budget Activity 1319 I 4		R-1 Program Element (Number/Name) PE 0603596N I (U)LCS Mission Modules			Project (Number/Name) 3129 I LCS Mission Package Development	
		Start		End		
Events by Sub Project		Quarter	Year	Quarter	Year	
SUW MP: SSMM TECEVAL (Free Var)		2	2018	2	2018	
SUW MP: SSMM IOT&E (Free Var)		2	2018	2	2018	
ASW MP: ASW MP PDR		2	2017	2	2017	
ASW MP: ASW MP CDR/PRR		3	2017	3	2017	
ASW MP: ASW MP Pre-Production Test Article (PPTA) Award		3	2017	3	2017	
ASW MP: Award phase III (Integration and Testing) CLIN on the Raytheon contract		2	2018	2	2018	
ASW MP: Award phase IV (Integrated Logistic Package) CLIN on Raytheon contract		2	2018	2	2018	
ASW MP: Procure Testing Spares to support DT/TECHEVAL/IOT&E in FY19		2	2018	2	2018	
ASW MP: ASW MPAS with CMS Integration and Testing (Land Based)		2	2018	2	2018	
ASW MP: Install Light Weight Tow (LWT) SHIPALT		2	2018	2	2018	
ASW MP: Conduct LWT Developmental Testing (DT/IT)		2	2018	2	2018	
ASW MP: Conduct EMM DVT (Design Verification Test)		3	2018	3	2018	
ASW MP: ASW MPAS with CMS integration and testing shipboard		3	2018	3	2018	
ASW MP: Conduct V&V of the VDS and Handling equipment		4	2018	4	2018	
ASW MP: Conduct WSESRB		4	2018	4	2018	
ASW MP: ASW MP PPTA 1 Delivery		1	2019	1	2019	
ASW MP: Establish LWT IOC		4	2016	4	2016	
ASW MP: ASW MP Integration (Freedom Variant)		1	2019	1	2019	
ASW MP: ASW MP DT-B3 (Freedom Variant)		1	2019	3	2019	
ASW MP: ASW MP TECHEVAL DT-C3 (Freedom Variant)		3	2019	3	2019	
ASW MP: ASW MP IOT&E OT-C3 (Freedom Variant)		3	2019	4	2019	
ASW MP: ASW MP IOC		4	2019	4	2019	
ASW MP: ASW MP DT-B6 (Independence Variant)		1	2020	1	2020	
ASW MP: ASW MP TECHEVAL DT-C6 (Independence Variant)		1	2020	1	2020	
ASW MP: ASW MP IOT&E OT-C6 (Independence Variant)		3	2020	3	2020	
Training: ASW LTF Initial Ready For Training		3	2020	3	2020	

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy					**Date:** May 2017

Appropriation/Budget Activity 1319 *I* 4	R-1 Program Element (Number/Name) PE 0603596N *I (U)LCS Mission Modules*	Project (Number/Name) 3129 *I LCS Mission Package Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Training: SUW Courseware Update (SSMM) RFT	4	2020	4	2020
Training: Initial LCS MM Baseline Final Ready for Training RFT	4	2019	4	2019