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 0604707N / *SEW Architecture/Eng Support*							
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	301.307	22.214	23.971	42.851	-	42.851	32.518	27.971	27.857	39.203	Continuing	Continuing
0798: *Allied/Coalition Interoperability and Information Dominance (ACIID)*	31.966	0.642	0.953	1.096	-	1.096	1.076	1.094	1.012	1.032	Continuing	Continuing
2144: *Space & Elec Warfare Engineering*	199.406	9.761	13.175	33.716	-	33.716	22.408	16.843	15.927	27.034	Continuing	Continuing
2147: *ISR Architecture*	0.000	0.000	1.523	1.587	-	1.587	1.583	1.584	1.585	1.617	Continuing	Continuing
2356: *Maritime Concept Generation & Development*	19.141	3.268	8.320	6.452	-	6.452	7.451	8.450	9.333	9.520	Continuing	Continuing
3319: *Fleet Experimentation*	50.794	8.543	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.337

A. Mission Description and Budget Item Justification

This Program Element (PE) includes the following projects: Maritime Concept Generation and Development (CGCD), Allied/Coalition Interoperability and Information Dominance (ACIID), Fleet Experimentation, Intelligence, Surveillance, and Reconnaissance (ISR) Architecture and Space and Electronic Warfare (SEW) Engineering.

The CGCD project (2356) focuses on the generation, development and validation of warfighting concepts, Concept of Operations (CONOPS) and doctrine in order to eliminate war fighting gaps. Naval Warfare Development Command (NWDC) also manages the Fleet Experimentation program (formerly Sea Trial). In FY2018 the project will execute a number of new experimentations in the areas of Electromagnetic Maneuver Warfare (EMW), Mine Warfare, Naval Integrated Fires, and Unmanned systems and conduct experiments (war simulations, Modeling & Simulation (M&S), at-sea events) to develop emerging Naval concepts.

The ACIID and SEW Engineering projects (0798 and 2144 respectively) are systems engineering non-acquisition programs to develop, test, implement Technical Authority (TA), and validate Naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business Information Technology (IT), and Space System architectures to support naval, Joint and Coalition missions across normal, contested, and degraded operational environments. The objectives of these projects are carried out by multiple tasks that ensure development and delivery of naval Information Warfare (IW) capabilities that are well-integrated, interoperable, secure, and resilient. These projects also ensure: (1) the combined operational capabilities of SEW systems conform to applicable integrated architectures, and associated specifications and standards, intended to drive the interoperability and cybersecurity of capabilities for validated warfighting requirements; (2) Program Executive Office Command, Control, Communications, Computers, Intelligence (PEO C4I) Programs of Record (PoR) cybersecurity test requirements are evaluated by the cybersecurity vulnerability and functional test capability of the C4I components of the USS Secure laboratory. (3) development of technical guidance (architectures, specifications, and standards) to implement a single integrated Navy plan for cyber; (4) SEW systems and systems integration efforts involve innovative technology insertion methodologies to reduce timeline and costs for development and delivery of operational capability.

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 0604707N *I SEW Architecture/Eng Support*

The ISR Architecture project (2147) is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment (JIE) and Intelligence Community (IC) Information Technology Environment (ITE). As tasked by the Navy's ISR Council, this effort to develop integrated ISR architectures will also help instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR POR progress in conforming to a single Navy architecture.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	20.203	23.971	25.233	-	25.233
Current President's Budget	22.214	23.971	42.851	-	42.851
Total Adjustments	2.011	0.000	17.618	-	17.618
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.599	0.000			
• SBIR/STTR Transfer	-0.588	0.000			
• Program Adjustments	0.000	0.000	17.324	-	17.324
• Rate/Misc Adjustments	0.000	0.000	0.294	-	0.294

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*	

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
0798: *Allied/Coalition Interoperability and Information Dominance (ACIID)*	31.966	0.642	0.953	1.096	-	1.096	1.076	1.094	1.012	1.032	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Allied/Coalition Interoperability and Information Dominance (ACIID) program advances Information Warfare (IW) (to include Command, Control, Communications, Computers; Intelligence, Surveillance and Reconnaissance (C4ISR); Electronic Warfare (EW); and Cyber Warfare), interoperability with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS), North Atlantic Treaty Organization (NATO), and other Allied and Coalition partners. The program determines maritime operational gaps with our allies, identifies Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) solutions with the potential to fill those gaps, and assesses these solutions and associated concepts of operation in laboratory and at-sea environments. The ACIID program includes integration and testing in support of joint and Allied war fighting capabilities, including interoperability testing of IW equipment. Allied and joint interoperability is critical for future maritime operations, especially as the United States Navy (USN) expands Internet Protocol (IP) networking throughout the fleet via Consolidated Afloat Networks and Enterprise Services (CANES), Next Generation Networks (NGEN), Mission Partner Environment/Future Mission Network (MPE/FMN), the U.S. Battlefield Information Collection and Exploitation System - eXtended (BICES-X), and with the Joint Information Environment (JIE). Currently, IP connectivity with AUSCANNZUKUS and other Allied/Coalition forces is limited, requiring extensive backhaul through ashore infrastructure. Higher bandwidth solutions suitable for use over tactical networks require development and assessment for emerging coalition and joint interoperability requirements, such as Maritime Domain Awareness (MDA), Network Operations Without Shore (NOWS), Satellite Communications (SATCOM) Denied, Degraded, Intermittent and Limited bandwidth (DDIL) operations, and to counter Anti-Access Area Denial (A2/AD) threats. Increases in data throughput are required for the effective exchange of rich IW data sets and services via Service Oriented Architectures (SOA) within the limitations of High Frequency (HF), Ultra-High Frequency (UHF), and other portions of the radio frequency spectrum, coupled with appropriate Information Assurance and Computer Network Defense (IA/CND) mechanisms. Development and assessment of potential solutions will integrate improved IP capabilities with the Advanced Digital Network Systems (ADNS) and existing international standards (e.g. Allied Communications Publication 200, NATO Standardization Agreements 5066 and 4691). The continued development and refinement of advanced tactical networking technologies and protocols, to include Low Probability of Intercept (LPI), Low Probability of Detection (LPD), and Anti-Jam (AJ) capabilities as well as Automatic Link Establishment (ALE) standards, will provide for a significant improvement in secure data sharing within, and between, coalition maritime elements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Relay Capabilities	0.642	0.953	1.096	0.000	1.096
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continued the development and refinement of advanced networking and communication capabilities that promoted Allied interoperability, task group-centric operations in SATCOM-Restricted and SATCOM-Denied environments, and supported the defeat of Anti-Access Area Denial (A2/AD). Solutions addressed higher bandwidth technologies across the Radio Frequency (RF) and Optical spectrum, such as wide-band High Frequency (HF), Ultra High Frequency (UHF), and other high-data rate wireless technologies. - Developed and assessed secure and interoperable multi-bearer routing, distributed application and service architectures and advanced Information Assurance/Computer Network Defense (IA/CND) solutions that support tactical networking and A2/AD requirements. Continued the overarching goal to maximize interoperability and network efficiency using multiple, dissimilar bearers and integrated these advanced solutions into an Allied/ Coalition tactical networking environment that will defeat A2/AD. - Continued to progress the standardization and operationalization of North Atlantic Treaty Organization (NATO) Maritime Relayed Line of Sight Network Standardization Agreements (STANAG 4691) and HF Internet Protocol (STANAG 5066 Edition 3). - Increased Allied Information Warfare (IW) interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronics Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), Mission Partner Environment (MPE), Future Mission Network (FMN), and the Joint Information Environment (JIE) forums. - Venues of opportunity, such as Fleet Experimentation (FLEX), were exploited to assess and validate the individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through limited experimentation, trials, and demonstrations with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS) and other Allied/Coalition partners.					
FY 2017 Plans: - Develop and refine advanced networking and communication capabilities that counter A2/AD environments and promote Allied interoperability and task group-centric operations. Solutions will address higher bandwidth, Low Probability of Intercept (LPI)/Low Probability of Detection (LPD)/Anti-Jam (AJ) technologies across the Radio Frequency (RF) and Optical spectrum and include airborne capabilities. - Develop and assess secure and interoperable technologies and capabilities that counter A2/AD environments, to include multi-bearer routing, MPE/FMN architectures that support distributed applications and service architectures, the use of cross-domain and data labeling solutions in maritime tactical networking environments (e.g. the U.S. Battlefield Information Collection and Exploitation System - extended (BICES-X) Trusted Network Engine, or TNE) and advanced IA/CND solutions. The overarching goal is to maximize interoperability and					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
network and application efficiency using multiple, dissimilar bearers and integrate these advanced solutions into an Allied/Coalition networking capability capable of countering A2/AD environments and integrated with MPE/ FMN architectures. - Assess the U.S. Battlefield Information Collection and Exploitation System - extended (BICES-X) technologies and associated interoperability issues in Satellite Communications (SATCOM) denied or degraded environments. - Increase Allied Information Warfare (IW) interoperability with other joint and maritime multi-national forums, such as the Combined Communications Electronic Board (CCEB), Multinational Maritime Information-system Interoperability Steering Group (M2I2), Mission Partner Environment (MPE), Future Mission Network (FMN), and Joint Information Environment (JIE) forums. - Assess and validate individual technologies, integrated solutions, and associated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) through experimentation, trials and demonstrations with Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS) and other Allied/Coalition partners during operational venues such as RIMPAC or Joint Warrior.					
FY 2018 Base Plans: - Continue refinement of advanced tactical networking and communication capabilities that facilitate Denied, Degraded, Intermittent and Low-bandwidth (DDIL) operations, which counter Anti-Access Area Denial (A2/AD) threats and promote Allied interoperability and task group-centric operations. Solutions will address higher bandwidth, Low Probability of Intercept (LPI)/Low Probability of Detection (LPD)/Anti-Jam (AJ) technologies across the Radio Frequency (RF) and Optical spectrum and include airborne capabilities. - Develop and assess secure and interoperable technologies and capabilities supporting DDIL operations, to include multi-bearer routing, distributed applications and services for MPE/FMN, the use of cross-domain and data labeling solutions in maritime tactical networking environments and advanced Information Assurance and Computer Network Defense (IA/CND) solutions. The overarching goal is to maximize interoperability and network and application efficiency using multiple, dissimilar bearers and integrate these advanced solutions into an Allied/Coalition networking capability capable of DDIL operations, countering A2/AD threats and integrating with MPE/FMN architectures. - Assess the BICES-X technologies and associated interoperability issues in DDIL environments. - Increase Allied IW interoperability with other joint and maritime multi-national forums, such as the CCEB, M2I2, MPE, FMN, and JIE forums.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 0798 / *Allied/Coalition Interoperability and Information Dominance (ACIID)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Assess and validate individual technologies, integrated solutions, and associated DOTMLPF through experimentation, trials and demonstrations with AUSCANNZUKUS and other Allied/Coalition partners during operational venues such as RIMPAC or Joint Warrior. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.642	0.953	1.096	0.000	1.096

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Allied/Coalition Interoperability and Information Dominance (ACIID) is a non-acquisition program that promotes United States Navy (USN) interoperability with allied and coalition forces to achieve the Chief of Naval Operations (CNO) vision by facilitating maritime interoperability in both processes and communications systems, including emerging capabilities, to counter growing high-end asymmetric threats, and is a key enabler of the force multiplying benefits achieved through cooperation among the Australia, Canada, New Zealand, United Kingdom, United States (AUSCANNZUKUS), North Atlantic Treaty Organization (NATO), and other partner nations. Activities include acquiring intellectual capital in emerging technical areas through contracts providing technical engineering expertise and surge capacity for emerging tasks.

E. Performance Metrics

Advanced Relay Capabilities: The ACIID program will employ laboratory testing and at-sea demonstrations to assess specific technologies, operational concepts, and integrated Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) solutions pertaining to Anti-Access Area Denial (A2/AD) environments, Network Operations Without Shore (NOWS), Maritime Domain Awareness (MDA), Mission Partner Environment (MPE)/Future Mission Networks (FMN), Joint Information Environment (JIE), and other aspects of Information Warfare (IW). These assessments will report on identified capability gaps, link capability gaps to technology/DOTMLPF gaps, identify technologies and DOTMLPF solutions considered ready for deployment, transition to a program of record to enhance Fleet war fighting capability, and enhance Allied interoperability.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2144 / *Space & Elec Warfare Engineering*	

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
2144: *Space & Elec Warfare Engineering*	199.406	9.761	13.175	33.716	-	33.716	22.408	16.843	15.927	27.034	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Planned Program titles changed as follows:
-Cybersecurity Architecture, Specifications and Standards (formerly known as Systems Engineering Standards and Processes)
-Enterprise Architecture (formerly known as Systems Engineering and Integration Revitalization)
-Systems Command (SYSCOM) Systems Engineering (formerly known as Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Systems Engineering)

A. Mission Description and Budget Item Justification

Fiscal Year (FY) 2018 funding increase is to establish the Command, Control, Communications, Computers, Intelligence (C4I) suite capabilities to provide a cybersecurity vulnerability and functional test capability within the USS Secure test laboratory.

Office of the Secretary of Defense (OSD) has defined several key programs, initiatives, and policies that drive Navy requirements prioritization and impact Navy Programs of Record (PoR). Major efforts include Joint Information Environment (JIE), the Intelligence Community Information Technology Environment (IC ITE) and the Risk Management Framework (RMF). The Navy has made a number of modifications to account for emerging threats in cyber and address the need for greater interoperability to support key warfighting missions.

Additionally, the Navy has defined Information Warfare (IW) objectives for Assured Command and Control (C2), Battlespace Awareness, Integrated Fires (IF), and Cyber capabilities that require significant changes and improvements to the Navy's approach for managing its information infrastructure, content, and effects. Potential adversaries will exploit perceived United States (U.S.) space and cyberspace vulnerabilities, which could impact U.S. information-handling capabilities and wartime readiness.

The Navy has identified Space and Naval Warfare Systems Command (SPAWAR) as responsible for Information Technology (IT) Technical Authority (TA), Information Assurance (IA) TA and lead for a cross-SYSCOM Technical Authority Board (TAB) to develop, monitor and approve architectures, technical standards, tools and processes that form the technical foundation of a single, integrated Navy plan for cybersecurity.

USS Secure is a cyber assessment program within the Naval Research and Development Establishment (NR&DE). This cross-SYSCOM, cross-domain, System of Systems (SoS) (Afloat, Aloft, C4I & Shore) capability in a test laboratory environment provides a rapidly re-configurable capability that can integrate real maritime hardware systems into a virtual complete platform for platform level SoS cybersecurity research, development, test and evaluation, and training, not otherwise possible.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

This combination of SYSCOM laboratories, cyber ranges, and Red Teams more accurately simulating Navy platforms in operational maritime environments is critical for effectively evaluating cyber threats against specified mission threads.

The cybersecurity vulnerability and functional test capability will support Program Executive Office Command, Control, Communications, Computers, Intelligence (PEO C4I) Programs of Record (PoR) cybersecurity test requirements and the C4I components of the USS Secure. This capability will provide a System of Systems (SoS) cyber test and assessment capability and facilitate the programs' compliance with both Department of Defense (DoD) (e.g. Risk Management Framework (RMF)) and Department of Navy (DoN) cybersecurity Test and Evaluation (T&E) policy, directives and requirements. This effort includes establishing and designing the capability to test operationally representative C4I baselines, to include force level platforms, unit level platforms, and associated shore services and transport capabilities. It will provide C4I enclave support to USS Secure enabling cyber assessments of systems and enclaves in an end-to-end environment. This program will include Red Team testing, Mission-thread Analysis, cyber risk assessments, and cyber base lining. Since no Objective Quality Evidence (OQE) of potential cyber threats on mission threads and C4I systems exists, this testing will prepare PoRs to meet and address acquisition milestones, Key Performance Parameters (KPPs), and test objectives.

The engineering artifacts developed through the Technical Authority Board (TAB) provide Navy-specific guidance that facilitates common and consistent implementation of security controls across current and future Navy PoRs and eliminate redundancies and inefficiencies characteristic of previous stove-pipe development efforts in which each system addressed security individually. These efforts enable a standardized and layered, Defense-in-Depth approach to improving the Navy's cybersecurity posture. This enables some Navy programs to inherit required security controls from other systems, thereby reducing their cybersecurity requirements and associated integration costs. The cybersecurity standards also support effective transition from Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) to RMF.

To realize the Information Warfare (IW) vision, the Navy will develop Information Technology (IT) and Information Assurance (IA) Technical Authority (TA) architectures, specifications, standards, and profiles to ensure Navy cyber capabilities can support critical warfighting functions in degraded or contested environments.

To support Navy objectives in advancing IW capabilities, the Space and Electronic Warfare (SEW) provides four main functions:
(1) Develop the architectures, specifications and standards to support a single integrated Navy plan for cybersecurity;
(2) Provide the cybersecurity vulnerability and functional test capability which supports cybersecurity test requirements and the C4I components of the USS Secure.
(3) Define an integrated Enterprise Architecture to support design, development and delivery of integrated Navy Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business IT, and Space System capabilities; and
(4) Drive rigorous Systems Engineering discipline to support rapid development and delivery of secure and interoperable C4ISR, Business IT, and Space Systems capabilities that meet Fleet requirements.

Products provided:
1) Integrated architectures, specifications and standards to reflect current (as-is) and future (target) end states to support technical analyses, program planning, and enterprise-level investment decisions across current and future C4ISR, Business IT, and Space System capabilities.
- Defense-in-Depth cybersecurity architectures and standards derived from National Institute of Standards and Technology (NIST) requirements and tailored for Navy-specific implementation in combat/weapon system, Naval control system, Business IT, and C4I programs across all of the Navy Systems Commands.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

- Fit for Purpose / Department of Defense Architecture Framework (DoDAF) compliant architecture views to support PoR Engineering/Acquisition documentation requirements and ensure alignment with applicable Joint Information Environment (JIE), Intelligence Community Information Technology Environment (IC ITE), Space and Naval Warfare Systems Command (SPAWAR) Enterprise Architecture, and other higher-level architectures.
2) Engineering tools and processes that support and drive consistent application of technical rigor across all design, development, validation and certification activities for C4ISR, Business IT, and Space IW systems.
- Single, authoritative repository to maintain validated engineering artifacts with associated technical performance attributes to support advanced model-based engineering analyses and studies.
- Development and refinement of model-based systems engineering tools to support mission thread driven analysis enabling the identification of capability gaps and overlaps, interoperability issues, and cybersecurity vulnerabilities between Navy System of Systems (SoS) capabilities.
- Initial planning and procurement to establish cybersecurity test capabilities and the Command, Control, Communications, Computers, Intelligence (C4I) components of the USS Secure, a cross-Systems Command (SYSCOM) distributed Cyber test capability in support of cybersecurity testing.
- Systems Engineering Technical Reviews (SETRs) to provide independent, objective assessments of the technical maturity and compliance with applicable architectures, specifications and standards for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business Information Technology (IT), and Space Systems.
- End-to-End Systems Engineering and Integrated Design - Operational feasibility studies, technical feasibility studies, technical roadmap engineering validations, architectures, and assessment traceability matrices.
- Engineering Evaluations to ensure delivered C4ISR, Business IT, and Space Systems are validated as meeting operational needs and interoperability requirements.
- Technical analysis and engineering artifacts to ensure integration and interoperability across Assured Command and Control (C2), Battlespace Awareness, and Integrated Fires (IF) to deliver integrated Information Warfare (IW) capabilities to Navy warfighters.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Cybersecurity Architecture, Specifications and Standards (Formerly known as Systems Engineering Standards and Processes)	5.527	8.250	7.931	0.000	7.931
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Developed Aviation and Ashore domain instantiations of the Defense-in-Depth Functional Implementation Architecture (DFIA). Space and Naval Warfare Systems Command (SPAWAR) completed three (3) of the five (5) DFIA instantiations directed by the Technical Authority Board (TAB). - Developed and coordinated IT/Information Assurance (IA) TAB endorsement on seven (7) cybersecurity standards. SPAWAR completed 14 of the 39 foundational standards identified by the TAB. - Continued IT/IA Technical Authority (TA) efforts to define, place under configuration control, and manage physical and logical interface requirements and IA controls for systems that connect to the Navy Enterprise Network.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Developed Navy Cybersecurity Situational Awareness (NCSA) requirements and interface specifications and standards; performed risk assessments to improve NCSA decision-making regarding the protection, detection, and response to cyber events on Navy networks and systems. - Carried forward efforts to leverage existing processes (e.g., SETR, Gate Reviews, etc.) to ensure Acquisition Category (ACAT) programs compliance with IT and IA TA specifications, standards and profiles. - Continued development of technical artifacts, including design documentation, to inform Navy Enterprise Network target end state activities while ensuring alignment with broader Department of Defense (DoD) Enterprise initiatives (e.g., Joint Information Environment (JIE), Intelligence Community Information Technology Environment (IC ITE)). - Initiated work to develop a common repository to serve as the authoritative source of Information Technology (IT) Technical Authority (TA) and Information Assurance (IA) TA architectures, specifications, standards and profiles.					
FY 2017 Plans: - Develop Space domain and Enterprise instantiations of the Defense-in-depth Functional Implementation Architecture (DFIA). Completion of these artifacts delivers all five (5) of the initial DFIA instantiations identified by the Technical Authority Board (TAB) to support common and consistent implementation of security controls across all Navy systems. - Complete development, TAB review, and promulgation of 25 cybersecurity standards to provide a complete set of 39 foundational cybersecurity standards for use and implementation across all Navy systems. - Develop platform as-programmed and target architectures to drive continued progress in reducing the number of unique interfaces across platform configurations through standardization. - Continue IT and IA TA efforts to define, place under configuration control, and manage physical and logical interface requirements and IA controls for systems that connect to the Navy Enterprise Network. - Continue to develop Navy Cybersecurity Situational Awareness (NCSA) requirements and interface specifications and standards to enable integration and interoperability across multiple tools and technologies. - Conduct cyber risk assessment analysis to improve NCSA decision-making regarding the protection, detection, and response to cyber events on Navy networks and systems. - Leverage existing processes (e.g., Systems Engineering Technical Review (SETR), Gate Reviews, etc.) to assess Acquisition Category (ACAT) programs compliance with IT and IA TA specifications and standards. - Mature the common repository as the authoritative source of IT/IA TA architectures, specifications, standards and profiles. Continue efforts to include Integration and Interoperability (I&I) outputs (e.g., Mission Technical					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Baselines (MTBs), Integrated Capability Technical Baselines (ICTBs)) and vignette descriptions within the repository to support mission/capability-driven and System of Systems (SoS) assessments. ***FY 2018 Base Plans:*** - Based on changes in the threat environment and advances in technology, continue to develop the architectures, specifications, and standards that provide the technical foundation of a single, integrated Navy plan for cybersecurity. - Enforce implementation guidance for Navy IA (cybersecurity) standards to ensure inclusion in design requirements and development and production contracts that touch or influence cybersecurity designs for Navy networks. - Review Navy Programs of Record (PoR) plans for implementation of cybersecurity controls, assess compliance with IA TA cybersecurity architectures and standards, and perform risk assessments that articulate systems' ability to effectively support operational missions in various cyber conditions. These assessments will provide operational commanders with a bounded statement of the cyber risk to execute their assigned missions. - Collaborate across Navy Systems Commands (SYSCOMs) to develop domain-specific implementations of the Defense-in-Depth Functional Implementation Architecture (DFIA) by defining control points, Information Assurance (IA) and logical attributes, controlling parameters, and inheritable security controls to establish a layered approach to cybersecurity. - Define enterprise-level engineering requirements to support effective implementation and integration of Navy Cybersecurity Situational Awareness (NCSA) tools. These efforts support development of advanced cyber capabilities that enable command and control of Navy networks under all cyber conditions. ***FY 2018 OCO Plans:*** N/A					
Title: Cybersecurity Vulnerability & Functional Test Capability	0.000	0.000	21.313	0.000	21.313
Articles:	-	-	2	-	2
FY 2016 Accomplishments: Cybersecurity compliance testing efforts previously funded under Cybersecurity Architecture, Specifications and Standards (formerly known as Systems Engineering Standards and Processes). ***FY 2017 Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Cybersecurity compliance testing efforts previously funded under Cybersecurity Architecture, Specifications and Standards (formerly known as Systems Engineering Standards and Processes). ***FY 2018 Base Plans:*** - Initial planning and procurement to establish cybersecurity test capabilities and the Command, Control, Communications, Computers, Intelligence (C4I) components of the USS Secure, a cross-SYSCOM distributed Cyber test capability in support cybersecurity testing. Procure two (2) laboratory assets, one (1) force-level and one (1) unit-level, to establish C4I suites for testing the system of systems cyber capabilities in an end-to-end environment. - Continue to perform Non-Recurring Engineering (NRE) and testing to evaluate the compliance efforts of Programs of Record (PoR's) with the Department of Defense (DoD) and the Department of Navy (DoN) cybersecurity Test and Evaluation (T&E) policy, directives and requirements. - Design the capability to test operationally representative C4I baselines including force level platforms, unit level platforms, and associated shore services and transport capabilities. - Develop and mature connectivity (including assessment and authorization) strategies to combine SYSCOM laboratories, cyber ranges, and Red Teams to develop more accurate simulations of Navy platforms in operational maritime environments allowing for critical and effective evaluation of cyber threats against specified mission threads. ***FY 2018 OCO Plans:*** N/A					
Title: Enterprise Architecture (Formerly known as Systems Engineering and Integration Revitalization)	0.835	0.969	0.846	0.000	0.846
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Continued to refine the Integration and Interoperability (I&I) Capability framework to support development of mission threads in order to perform System of Systems (SoS) analyses of how well systems operate together to deliver validated warfighting capabilities. The outputs of these broader analyses identify interoperability issues and cybersecurity vulnerabilities, that would otherwise be unknown, and inform design and development activities across individual programs. - Completed assessments of mission area capabilities for the Anti-Submarine Warfare; Surface Warfare; Intelligence, Surveillance and Reconnaissance (ISR); Targeting Maneuver for Surface Warfare; and Mine Warfare mission areas. Developed course of action options with recommendations to target the cybersecurity and I&I issues identified as highest priority by Fleet operators and the Chief of Naval Operations (CNO) staff.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Continued to evolve Assured Command and Control (C2), Battlespace Awareness, and Integrated Fires (IF) Integrated Capability Technical Baselines (ICTBs) to ensure Information Warfare (IW) capabilities align to mission-specific kill chains to reduce interoperability seams across the supporting SoS. - Established robust, foundational mission engineering tools (e.g., executable architecture models) to support I&I technical performance gap analysis and trade recommendations. - Reviewed the impact of I&I Systems Engineering Technical Review (SETR) checklist items on Acquisition Category (ACAT) programs to determine SETR outcomes and acquisition system improvements to deliver fully integrated and interoperable warfighting capabilities.					
FY 2017 Plans: - Continue to refine the I&I Capability framework to support development of mission threads in order to perform SoS analyses of how well systems operate together to deliver validated warfighting capabilities. The outputs of these broader analyses identify interoperability issues and cybersecurity vulnerabilities, that would otherwise be unknown, and inform design and development activities across individual programs. - Continue to evolve Assured C2, Battlespace Awareness, and IF ICTBs to ensure IW capabilities align to mission-specific kill chains to reduce interoperability seams across the supporting SoS. - Establish and mature robust mission engineering tools (e.g., executable architecture models) to support I&I technical performance gap analysis and trade recommendations. - Review impact on Acquisition Category (ACAT) I, II, and III programs of Integration and Interoperability (I&I) Systems Engineering Technical Review (SETR) checklist items on SETR outcomes and acquisition system improvements to deliver fully integrated and interoperable warfighting capability.					
FY 2018 Base Plans: - Develop an overarching Space and Naval Warfare Systems Command (SPAWAR) Enterprise Architecture with associated specifications, standards and profiles that encompasses current and future platform, experimental, software, data, and product architectures to support effective engineering, design, development, acquisition, and delivery of Navy Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Business Information Technology (IT), and Space System capabilities. Ensure engagement with Department of Defense (DoD) Joint Information Environment (JIE) and Intelligence Community Information Technology Environment (IC ITE) to promote Joint and Coalition Interoperability. - Develop a single, authoritative SPAWAR architecture repository that provides a technical framework to support engineering and investment decisions across the Information Warfare (IW) portfolio.					

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
- Define data engineering models, strategies, and approaches, as well as data-at-rest and data exchange standards, for program and project compliance. This ensures alignment of product architectures across the SPAWAR Enterprise and facilitates data ingestion into the architecture repository. - Continue to refine the I&I Capability framework to support development of mission threads in order to perform System of Systems (SoS) analyses of how well systems operate together to deliver validated warfighting capabilities. The outputs of these broader analyses identify interoperability issues and cybersecurity vulnerabilities, that would otherwise be unknown, and inform design and development activities across individual programs. - Continue to evolve and use Command and Control (C2), Battlespace Awareness, and Integrated Fires (IF) Integrated Capability Technical Baselines (ICTBs) to perform analysis of mission performance and cybersecurity, identify capability gaps, perform engineering trade studies, and inform investment decisions. - Ensure alignment of ICTBs development to emerging Task Force Netted Navy (TFNN) (now know as the Digital Warfare Office (DWO)) objectives for increased interoperability and information sharing across weapons, sensors, and shooters. ***FY 2018 OCO Plans:*** N/A					
Title: SYSCOM Systems Engineering (Formerly known as C4ISR Systems Engineering)	2.562	2.973	2.594	0.000	2.594
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Continued to provide input and technical reviews of Acquisition documentation to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability. - Continued to develop and validate interoperability requirements by performing Systems Engineering Technical Reviews (SETRs) on Acquisition Category (ACAT) programs utilizing validated assessment tools, system engineering methodologies, and SETR checklists tracing system design to standards and requirements, and ensuring interoperability compliance to statutory and regulatory directives. - Continued to provide engineering evaluations and validation of Business Information Technology (IT) applications and IT infrastructure in order to combine, consolidate, and eliminate unnecessary or underutilized business systems. - Continued to provide engineering evaluations, assessments of compliance with authoritative architectures and technical standards, and expertise to address technical issues in the following domains: Command and Control					

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
(C2); Intelligence, Surveillance, & Reconnaissance/Information Operations (ISR/IO); Space Systems, Business IT; and Communications & Networks. - Continued to provide Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Certifications through design and testing analysis ensuring C4ISR delivery to the platform (shore, surface ship, submarine) was validated to meet the operational need and was interoperable with platform, force level, and joint/allied/coalition forces. ***FY 2017 Plans:*** - Continue to develop and validate interoperability requirements by performing SETRs on ACAT programs utilizing validated assessment tools, system engineering methodologies, and SETR checklists tracing system design to standards and requirements, and ensuring interoperability compliance to statutory and regulatory directives. - Implement continuous improvement on SETR Checklists for ACAT programs by incorporating the latest policy, guidance, standards, and specifications, including specific criteria for effective implementation of and compliance with IT and Information Assurance (IA) Technical Authority (TA) architectures, specifications, standards and profiles. - Continue to develop input and conduct technical reviews of Acquisition documentation to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability. - Continue to perform engineering evaluations and validation of Business IT applications and IT infrastructure in order to combine, consolidate, and eliminate unnecessary or underutilized business systems. - Continue to perform engineering evaluations, assessments of compliance with authoritative architectures and technical standards, and provide expertise to address technical issues in the following domains: C2; ISR/IO; Space Systems, Business IT; and Communications & Networks. - Continue to conduct C4ISR Certifications through design and testing analysis ensuring C4ISR delivery to the platform (shore, surface ship, submarine) is validated to meet the operational need and is interoperable with platform, force level, and joint/allied/coalition forces. ***FY 2018 Base Plans:*** - Perform Systems Engineering Technical Reviews (SETRs) of Acquisition programs ensuring compliance with statutory and regulatory directives, as well as applicable Information Technology (IT) and Information Assurance (IA) standards.					

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
- Develop inputs and perform technical reviews of formal acquisition and engineering documentation to ensure the application of sound systems engineering analysis and design principles to system planning requirements, design, testing, and supportability. Provide independent technical analyses to support Milestone Decisions. - Continue to conduct Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) certifications through design and testing analysis, ensuring C4ISR delivery to the platform (shore, surface ship, submarine) is validated to meet the operational need and is interoperable with platform, force level, and joint/allied/coalition forces. - Assess opportunities to leverage existing processes to define a more holistic cyber certification that moves toward assessments of groups of platforms (i.e., Carrier Strike Groups) and the overall cyber risk to performing operational missions. - Continue to perform engineering evaluations, assessments of compliance with authoritative architectures and technical standards, and provide expertise to address technical issues in the following domains: Command and Control (C2); Intelligence, Surveillance, & Reconnaissance/Information Operations (ISR/IO); Space Systems, Business IT; and Communications & Networks. - Execute the Space and Naval Warfare Systems Command (SPAWAR) Engineering Competency Development Model (CDM) to ensure structured workforce development and maturity of the Engineering competency. ***FY 2018 OCO Plans:*** N/A					
Title: Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) ***Articles:***	0.837 -	0.983 -	1.032 -	0.000 -	1.032 -
FY 2016 Accomplishments: -Developed interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of C4ISR systems within the Navy and in conjunction with Joint Services and Coalition efforts. -Enhanced integration and engagement with Pacific Rim (PACOM AO) Coalition partners as well as Coalition partners in the Southern Command Area of Operation (SOUTHCOM AO) by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas. -Utilized Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) infrastructure to enhance interoperability amongst North Atlantic Treaty Organization (NATO) Coalition partners. -Utilized existing events such as Coalition Interoperability Assurance Validation (CIAV) and Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX) to expose interoperability issues					

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
between United States (U.S.) and Coalition Partner systems and report issues and possible workarounds to relevant entities. -Leveraged CIAV infrastructure to enhance U.S. maritime interoperability within the Joint Information Environment (JIE) Mission Partner Environment (MPE). -Coordinated experimentation with applicable acquisition and operational entities (i.e. Program Executive Office Command, Control, Communications, Computers, Intelligence (PEO C4I), Component/ Combatant Commanders at the Technical Director and Science Advisor levels) in order to assess interoperability between existing and cutting-edge Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems. -Continued development of suitable environments for Joint/Coalition war fighter technology experiments. Periodic connectivity will be continued with end-users in order to provide a distributed Coalition experimentation environment focused enhancement of Navy missions.					
FY 2017 Plans: -Continue to develop interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of C4ISR systems within the Navy and in conjunction with Joint Services and Coalition efforts. -Pursue greater Pacific Rim (PACOM) Partner Nation and Southern Command (SOUTHCOM) Partner Nation engagement by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas. -Foster enhanced interoperability amongst North Atlantic Treaty Organization (NATO) and affiliated Coalition Partners by participating in the planning and execution of CWIX. -Assess Coalition Interoperability assurance, validation, and verification as related to the engineering and execution of the MPE via the CIAV infrastructure. - Coordinate experimentation activities with appropriate acquisition and operational entities (i.e. PEO C4I, Component/ Combatant Commanders at the Technical Director and Science Advisor levels) in order to create synergy and provide the most value.					
FY 2018 Base Plans: -Continue to develop interoperability and information sharing through coalition engagement, technology, demonstrations, and assessments leading to improvements of C4ISR systems within the Navy and in conjunction with Joint Services and Coalition efforts.					

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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
-Continue to pursue and utilize greater PACOM Partner Nation and SOUTHCOM Partner Nation engagement by fostering a connected, distributed experimentation environment suitable for expanded experimentation in those areas to include innovative enhancements such as Commercial Solutions for Classified (CSFC). -Enhance interoperability amongst North Atlantic Treaty Organization (NATO) and affiliated Coalition Partners by participating in the planning and execution of Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise (CWIX). -Continue to assess Coalition Interoperability assurance, validation, and verification as related to the engineering and execution of the Mission Partner Environment (MPE) via the Coalition Interoperability Assurance Validation (CIAV) infrastructure. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	9.761	13.175	33.716	0.000	33.716

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Space and Electronic Warfare (SEW) Engineering is a non-acquisition program that develops, tests, implements technical authority, and validates naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR); provides integrated architecture products and supports C4ISR systems engineering processes and standards. Activities include acquiring intellectual capital in emerging technical areas through contracts providing technical engineering expertise and surge capacity for emerging tasks.

E. Performance Metrics

The SEW engineering program will employ rigorous and consistent system engineering practices in an evolving value model to support development and deployment of shipboard, undersea, and land based capabilities based on mission and performance requirements, integrated enterprise architectures, model-validated solutions, and sustainment and supportability needs for the Command and Control, Intelligence, Networks, Communications, Space, and Business Information Technology (IT) domains.

CWIX Performance Metrics: Three key metrics: (1) Interoperability and compliance with Naval (Navy and Marine Corps), joint, coalition and other non-governmental organization architectures, systems and equipment; (2) Compliance with Defense Information Services Agency (DISA), National Security Agency (NSA), and other

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joint and coalition information assurance and security standards; and (3) war fighter utility assessment across the joint and coalition spectrum. Specific metrics validate performance of individual technologies participating in CWIX.

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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
Cybersecurity Architecture, Specifications and Standards	Various	Various : Various	5.588	0.000		0.000		0.000		-		0.000	0.000	5.588	-
Cybersecurity Architecture, Specifications and Standards	C/CPFF	ComGlobal : San Diego, CA	1.454	0.000		0.000		0.000		-		0.000	0.000	1.454	-
Cybersecurity Architecture, Specifications and Standards	C/CPFF	AUSGAR : San Diego, CA	3.529	0.974	Mar 2016	1.135	Mar 2017	0.989	Mar 2018	-		0.989	Continuing	Continuing	Continuing
Cybersecurity Architecture, Specifications and Standards	C/CPFF	METRON : Reston, VA	0.813	0.000		0.000		0.000		-		0.000	0.000	0.813	-
Cybersecurity Architecture, Specifications and Standards	C/CPFF	SAIC : McLean, VA	0.812	0.000		0.000		0.000		-		0.000	0.000	0.812	-
Cybersecurity Architecture, Specifications and Standards	WR	SSC LANT : Charleston, NC	1.991	0.885	Feb 2016	1.238	Feb 2017	1.189	Feb 2018	-		1.189	Continuing	Continuing	Continuing
Cybersecurity Architecture, Specifications and Standards	WR	SSC PAC : San Diego, CA	5.222	2.191	Feb 2016	3.013	Feb 2017	2.886	Feb 2018	-		2.886	Continuing	Continuing	Continuing
Cybersecurity Architecture, Specifications and Standards	C/CPFF	BAH : McLean, VA	3.200	1.494	Aug 2016	2.864	Aug 2017	2.867	Aug 2018	-		2.867	Continuing	Continuing	Continuing
Cybersecurity Vulnerability & Functional Test Capability	C/CPFF	SSC : San Diego, CA	0.000	0.000		0.000		2.880	Jun 2018	-		2.880	0.000	2.880	-
Cybersecurity Vulnerability & Functional Test Capability	WR	SSC PAC : San Diego, CA	0.000	0.000		0.000		13.262	Dec 2017	-		13.262	0.000	13.262	-
Cybersecurity Vulnerability & Functional Test Capability	WR	SSC LANT : Charleston, NC	0.000	0.000		0.000		4.421	Dec 2017	-		4.421	0.000	4.421	-

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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
Cybersecurity Vulnerability & Functional Test Capability	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.750	Oct 2017	-		0.750	0.000	0.750	-
		Subtotal	22.609	5.544		8.250		29.244		-		29.244	-	-	-

Support ($ 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
Development Support	Various	Various : Various	4.554	0.000		0.000		0.000		-		0.000	0.000	4.554	-
SEW/C4I Technology Integration	Various	Various : Various	12.985	0.000		0.000		0.000		-		0.000	0.000	12.985	-
MDA Prototype SE Support	Various	Various : Various	17.376	0.000		0.000		0.000		-		0.000	0.000	17.376	-
Enterprise Architecture	Various	Various : Various	2.383	0.000		0.000		0.000		-		0.000	0.000	2.383	-
Enterprise Architecture	C/CPFF	ComGlobal : San Diego, CA	0.565	0.000		0.000		0.000		-		0.000	0.000	0.565	-
Enterprise Architecture	C/CPFF	AUSGAR : San Diego, CA	1.367	0.373	Mar 2016	0.436	Mar 2017	0.380	Mar 2018	-		0.380	Continuing	Continuing	Continuing
Enterprise Architecture	C/CPFF	METRON : Reston, VA	0.316	0.000		0.000		0.000		-		0.000	0.000	0.316	-
Enterprise Architecture	C/CPFF	SAIC : McLean, VA	0.316	0.000		0.000		0.000		-		0.000	0.000	0.316	-
Enterprise Architecture	WR	SSC LANT : Charleston, NC	0.869	0.125	Feb 2016	0.145	Feb 2017	0.127	Feb 2018	-		0.127	Continuing	Continuing	Continuing
Enterprise Architecture	WR	SSC PAC : San Diego, CA	2.094	0.333	Feb 2016	0.388	Feb 2017	0.339	Feb 2018	-		0.339	Continuing	Continuing	Continuing
Enterprise Architecture	WR	NRL : Washington, D.C.	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Systems A&E and Validation	Various	Various : Various	13.188	0.000		0.000		0.000		-		0.000	0.000	13.188	-

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Support ($ 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
Distributed C2 Interoperability Requirement analysis	Various	Various : Various	16.583	0.000		0.000		0.000		-		0.000	0.000	16.583	-
C4ISR Architecture and Standards	Various	Various : Various	14.268	0.000		0.000		0.000		-		0.000	0.000	14.268	-
End-to-End System Engineering and Integrated Design	Various	Various : Various	10.994	0.000		0.000		0.000		-		0.000	0.000	10.994	-
Info. Repository/Naval Architecture	Various	Various : Various	4.000	0.000		0.000		0.000		-		0.000	0.000	4.000	-
SYSCOM Systems Engineering	Various	Various : Various	5.157	0.000		0.000		0.000		-		0.000	0.000	5.157	-
SYSCOM Systems Engineering	WR	NSWC Dahlgren : Dahlgren, MD	0.879	0.000		0.000		0.000		-		0.000	0.000	0.879	-
SYSCOM Systems Engineering	MIPR	DISA : Pensacola, FL	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
SYSCOM Systems Engineering	C/CPFF	ComGlobal : San Diego, CA	7.636	0.000		0.000		0.000		-		0.000	0.000	7.636	-
SYSCOM Systems Engineering	C/CPFF	AUSGAR : San Diego, CA	1.610	1.505	Mar 2016	1.755	Mar 2017	1.529	Mar 2018	-		1.529	Continuing	Continuing	Continuing
SYSCOM Systems Engineering	WR	SSC LANT : Charleston, NC	0.440	0.000		0.000		0.000		-		0.000	0.000	0.440	-
SYSCOM Systems Engineering	WR	SSC PAC : San Diego, CA	4.747	0.740	Feb 2016	0.863	Feb 2017	0.754	Feb 2018	-		0.754	Continuing	Continuing	Continuing
SYSCOM Systems Engineering	C/CPFF	SAIC : McLean, VA	0.326	0.304	Jan 2016	0.355	Jan 2017	0.311	Jan 2018	-		0.311	Continuing	Continuing	Continuing
SYSCOM Systems Engineering	WR	NAVAIR : Patuxent River, MD	0.088	0.000		0.000		0.000		-		0.000	0.000	0.088	-
SYSCOM Systems Engineering	MIPR	CECOM : Fort Monmouth, NJ	0.264	0.000		0.000		0.000		-		0.000	0.000	0.264	-
SYSCOM Systems Engineering	MIPR	AF : Hill AFB, UT	0.220	0.000		0.000		0.000		-		0.000	0.000	0.220	-

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Support ($ 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
		Subtotal	123.541	3.380		3.942		3.440		-		3.440	-	-	-

Remarks

Cost Category titles changed as follows:
-Cybersecurity Architecture, Specifications and Standards (formerly known as Systems Engineering Standards and Processes)
-Enterprise Architecture (formerly known as Systems Engineering and Integration Revitalization)
-Systems Command (SYSCOM) Systems Engineering (formerly known as Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Systems Engineering)

Test and Evaluation ($ 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
SEW Eng/CWIX	Various	Various : Various	30.171	0.000		0.000		0.000		-		0.000	0.000	30.171	-
SEW Eng/CWIX	MIPR	Defense Information Systems Agency : Arlington, VA	0.506	0.093	Apr 2016	0.110	Apr 2017	0.115	Apr 2018	-		0.115	Continuing	Continuing	Continuing
SEW Eng/CWIX	WR	Joint Interoperability Test Command : Fort Huachuca, AZ	2.204	0.000		0.000		0.000		-		0.000	0.000	2.204	-
SEW Eng/CWIX	WR	SSC PAC : San Diego, CA	3.510	0.467	Dec 2015	0.549	Dec 2016	0.576	Dec 2017	-		0.576	Continuing	Continuing	Continuing
SEW Eng/CWIX	MIPR	US Northern Command : Peterson AFB, CO	0.332	0.000		0.000		0.000		-		0.000	0.000	0.332	-
SEW Eng/JRAE	Various	Various : Various	15.978	0.000		0.000		0.000		-		0.000	0.000	15.978	-
SEW Eng/CWIX	C/CPFF	SAIC : McLean, VA	0.317	0.181	Aug 2016	0.213	Aug 2017	0.223	Jun 2018	-		0.223	Continuing	Continuing	Continuing
SEW Eng/CWIX	C/CPFF	AUSGAR : San Diego, CA	0.167	0.096	Mar 2016	0.111	Mar 2017	0.118	Mar 2018	-		0.118	Continuing	Continuing	Continuing
		Subtotal	53.185	0.837		0.983		1.032		-		1.032	-	-	-

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 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

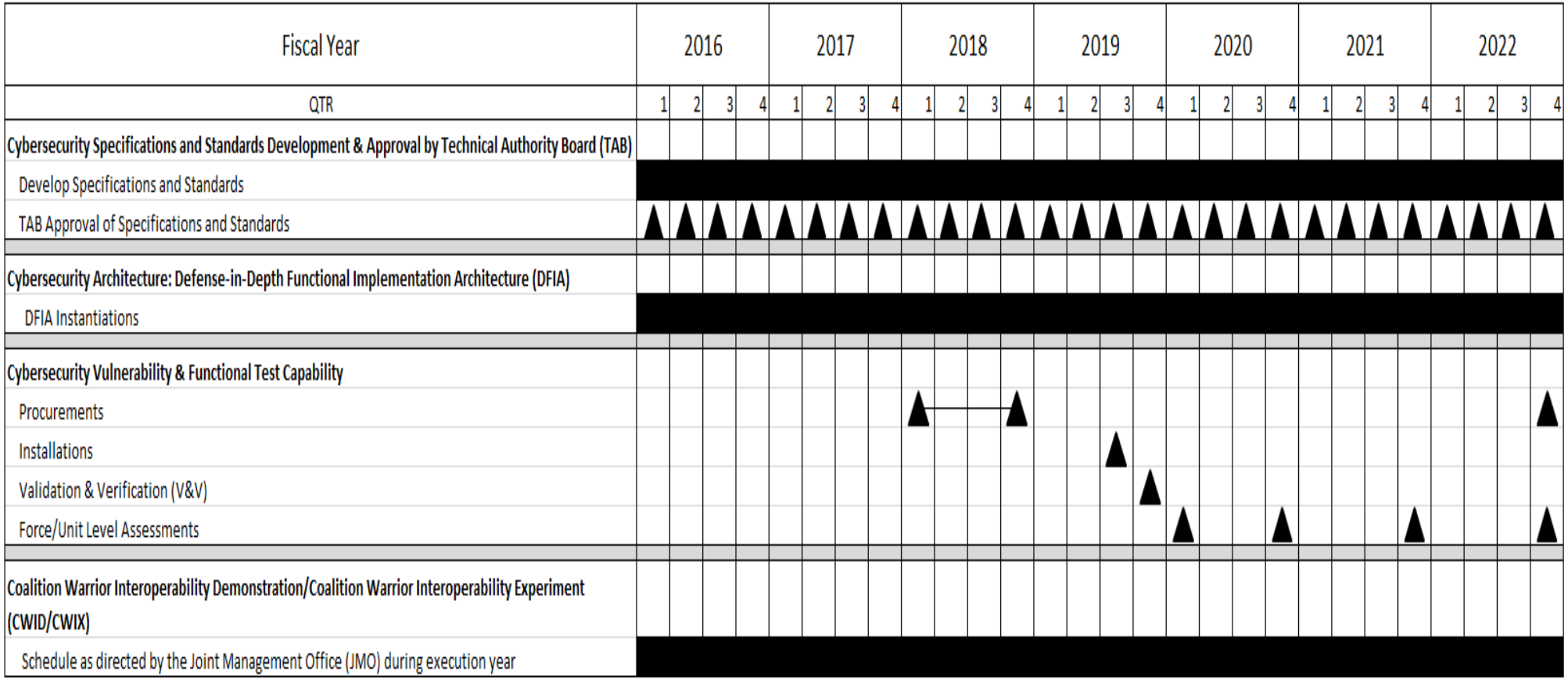
Management Services ($ in Millions)

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
ACQ Workforce Fund	Various	Various : Various	0.071	0.000		0.000		0.000		-		0.000	0.000	0.071	-
		Subtotal	0.071	0.000		0.000		0.000		-		0.000	0.000	0.071	-

	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	199.406	9.761		13.175		33.716		-		33.716	-	-	-

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 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*



Notes:

-Based on changes in the threat environment and advances in technology, the development of cybersecurity architectures, specifications, and standards is a continuous process.

-The cross-Systems Command (SYSCOM) TAB occurs approximately once per quarter to review and endorse cybersecurity architectures, specifications, and standards that are applicable to all Navy programs.

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 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2144 / *Space & Elec Warfare Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2144				
Cybersecurity Specifications and Standards: Development	1	2016	4	2022
Cybersecurity Specifications and Standards: Technical Authority Board (TAB) Approval	1	2016	4	2022
Cybersecurity Architecture: Defense-in-Depth Functional Implementation Architecture (DFIA) Instantiations	1	2016	4	2022
Cybersecurity Vulnerability & Functional Test Capability: FY18 Procurement	1	2018	4	2018
Cybersecurity Vulnerability & Functional Test Capability: FY22 Procurement	4	2022	4	2022
Cybersecurity Vulnerability & Functional Test Capability: Installations	3	2019	3	2019
Cybersecurity Vulnerability & Functional Test Capability: Validation & Verification	4	2019	4	2019
Cybersecurity Vulnerability & Functional Test Capability: Initial Assessments	1	2020	1	2020
Cybersecurity Vulnerability & Functional Test Capability: FY20 Assessments	4	2020	4	2020
Cybersecurity Vulnerability & Functional Test Capability: FY21 Assessments	4	2021	4	2021
Cybersecurity Vulnerability & Functional Test Capability: FY22 Assessments	4	2022	4	2022
Coalition Warrior Interoperability Demonstration/Coalition Warrior Interoperability Experiment (CWID/CWIX): Schedule as directed by the JMO during execution year	1	2016	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 2147 / *ISR Architecture*	

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
2147: *ISR Architecture*	0.000	0.000	1.523	1.587	-	1.587	1.583	1.584	1.585	1.617	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Integrated architectures provide a technical framework for assessing capability gaps and performance of individual systems and systems of systems and their ability to effectively provide the desired effects to support warfighting missions. They also serve as a means to influence and drive Programs of Record (PoR) toward a common, more efficient state that promotes interoperability and security.

The Naval Intelligence, Surveillance, and Reconnaissance (ISR) Reference Architecture project is intended to guide system of systems capability development and promote interoperability across Navy ISR programs, as well as interoperability and alignment with Department of Defense (DoD)-wide enterprise initiatives including Joint Information Environment (JIE) and Intelligence Community (IC) Information Technology Environment (ITE) and Space & Naval Warfare Systems Command (SPAWAR)-wide Enterprise Architecture policies. As tasked by the Navy's ISR Council, this effort to develop integrated ISR architectures will also help instill systems engineering discipline and standardization across the Navy ISR Enterprise and provide a means by which to assess ISR PoR progress in conforming to a single Navy architecture. These efforts will help reduce Information Technology (IT)/ISR infrastructure complexity and variance, making it easier to manage, operate and defend our ISR capabilities, and help inform investment decisions across the Navy's ISR enterprise to support the Office of the Chief of Naval Operations (OPNAV) objectives for Assured Command and Control (C2), Battlespace Awareness and Integrated Fires (IF).

This effort will encompass the documentation and analysis of current ISR enterprise architectures to inform and guide requirements for target architecture development and performance requirements to support full use and incorporation of ISR capabilities to advance Navy operations afloat. The associated studies will produce both technical and non-technical implementation guidance across the Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) spectrum.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Intelligence, Surveillance, and Reconnaissance (ISR) Architecture	0.000	1.523	1.587	0.000	1.587
Articles:	-	-	-	-	-
FY 2016 Accomplishments: N/A					
FY 2017 Plans: -Analyze the current ISR capabilities of afloat, ashore, joint, and national systems within mission contexts to demonstrate gaps and overlaps in Information Warfare capabilities and document in engineering artifacts and architectures. Perform trade space analysis and develop and quantify solutions using technical and operational performance parameters.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Build on the documentation and analysis of the enterprise ISR capabilities to support system of systems engineering assessments to identify integration and interoperability gaps, trades, and solutions for sponsor-related equities. -Integrate the National Intelligence, Surveillance, and Reconnaissance (ISR) and Naval (Navy and Marine Corps) ISR architectures within mission contexts to identify functional capacities, materiel integration and interoperability gaps and overlaps, as well as any policy and doctrine impacts. -Perform Verification and Validation (V&V) to ensure ISR architecture and analytic products accurately capture system performance specifications. -Capture all architectural data in the Space & Naval Warfare Systems Command (SPAWAR) analysis tool suite to support rigorous engineering assessments and architecture excursions against solution alternatives.					
FY 2018 Base Plans: -Analyze the current ISR capabilities of afloat, ashore, joint, and national systems within mission contexts to demonstrate gaps and overlaps in Information Warfare capabilities and document in engineering artifacts and architectures. Perform trade space analysis and develop and quantify solutions using technical and operational performance parameters. -Build on the documentation and analysis of the enterprise ISR capabilities to support system of systems engineering assessments to identify integration and interoperability gaps, trades, and solutions to support investment decision-making across the ISR portfolio. -Integrate the National, Joint, and Naval ISR architectures within mission contexts to identify functional capacities, materiel integration and interoperability gaps and overlaps, as well as any policy and doctrine impacts. -Ensure alignment and interoperability between ISR Architectures and Joint Information Enterprise (JIE), Intelligence Community (IC) Information Technology Enterprise (ITE) and SPAWAR Enterprise Architectures. -Perform V&V to ensure ISR architecture and analytic products accurately capture system performance specifications. V&V activities are essential to ensuring data, pulled from a broad range of sources with varying pedigree, can be reliably used to support modeling and simulation efforts and results in effective analyses and recommendations. -Capture all architectural data in the SPAWAR analysis tool suite to support rigorous engineering assessments and architecture excursions against solution alternatives.					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2147 / *ISR Architecture*

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					
Accomplishments/Planned Programs Subtotals	0.000	1.523	1.587	0.000	1.587

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Naval Intelligence, Surveillance, and Reconnaissance (ISR) Architecture project is a non-acquisition program that provides integrated architecture products, engineering analysis of current and target/future capabilities to identify capability gaps and shortfalls and provide solution recommendations. These combined efforts support the ability to articulate risks and align and prioritize investment decision recommendations within the ISR domain for the Navy.

E. Performance Metrics

The Naval (Navy and Marine Corps) ISR Reference Architecture effort will use consistent systems engineering practices to support development of integrated ISR enterprise architectures, model-validated solution recommendations against quantified technical and operational performance parameters.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*				Project (Number/Name) 2356 / *Maritime Concept Generation & 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**
2356: *Maritime Concept Generation & Development*	19.141	3.268	8.320	6.452	-	6.452	7.451	8.450	9.333	9.520	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Maritime Concept Generation and Development funding provides naval warfare subject matter expertise, experiment planning expertise, Modeling and Simulation (M&S) support, and analysis expertise to enable execution of the planned experiment efforts (and the individual experiment initiatives contained within) in the areas of Electromagnetic Maneuver Warfare (EMW), Mine Warfare, Naval Integrated Fires, and Unmanned systems and conduct experiments (wargames, M&S, at-sea events) to develop emerging Naval concepts.
Typical deliverables for each experimental effort include:
- Experiment control plan
- Data Collection and Analysis Plan (DCAP)
- Experiment Analysis Summary Reference Document
- Experiment Engineering Plan
- Final Experiment Report (with DOTMLPF recommendations)
- New/refined doctrine/Tactics, Techniques and Procedures (TTP).

The Maritime Concept Generation and Concept Development project funds four main efforts:
(1) Provides critical concept development and experimentation manpower and warfighting subject matter expertise aligned with the Concept Generation/Concept Development (CG/CD) program. The priorities for the CG/CD program are to develop concept/concept of operations and explore near/far-term technological and non-technological solutions to war fighting gaps across all naval warfare areas. The associated experimentation efforts include planning, systems engineering and integration, modeling and simulation support, event execution, data collection, analysis, and assessment for a wide-range of experimentation efforts including the examination of prototypes, tactical development and evaluation, support for S&T innovation, and program of record system development; venues such as workshops, seminars, war games, limited objective experiments, limited technical experiments, and live at-sea events are used to execute these experimentation efforts.
(2) Provides naval warfare subject matter expertise, experiment planning expertise, and analysis expertise to NWDC who plans, executes, and assesses fleet experimentation for the fleets and warfighting development centers (WDC) at the operational and tactical levels. This experimentation includes a focus on NWDC's WDC integration role, maritime command and control (C2), advanced cross-domain warfighting, and maritime operations centers (MOCS)/operational level of war (OLW) lines of operations. Fleet experimentation seeks to solve fleet-identified warfighting gaps (referenced within the Integrated Prioritized Capability Lists (IPCL), Urgent Operational Needs Statements (UONS), CUSFF/CPF Commander's Guidance, etc.). The experimentation and prototyping efforts of the NWDC team support the "last tactical mile" of many Navy Science and Technology (S&T) programs by supporting those programs where the technology is mature enough, but requires evaluation on or by a "fleet asset" - ships, airplanes, submarines, and sailors.
(3) Provides modeling and simulation (M&S) support to Fleet and NWDC experimentation efforts. M&S is used to stimulate decision making during seminar-style and system war gaming experiments and provides the simulated operational environment and capabilities with high-fidelity models such as the Joint Semi-Automated Force

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

(JSAF) program. Additionally, where applicable, the Navy Simulation System (NSS) "Monte Carlo" model is also used to give high confidence solutions and outcomes to complex warfighting problems.
(4) Provides for focused, solution-driven tactics development and evaluation through experimentation. This effort is focused on developing near-term doctrine solutions to address specific fleet-identified tactical issues.

Typical Maritime Concept Generation and Concept Development products include:
- Enabling concepts
- Concepts of operations (CONOPS)
- Final experiment reports (including findings, insights, and recommendations and DOTMLPF change recommendations and plans for action)
- Experiment Analysis Summary Reference Documents
- New/revised doctrinal and Tactics/Techniques/Procedures publications
- White papers (think pieces) intended to generate further discussion within Navy leadership

Specific products are listed in the Accomplishments/Plans section of this exhibit.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Maritime Concept Generation and Development	3.268	8.320	6.452	0.000	6.452
Articles:	-	-	-	-	-
Description: In FY 2016, this project funded/provided: - NWDC management, planning, and execution and analysis support to Fleet experimentation. - Modeling and Simulation support for Fleet experimentation. - Tactics, Techniques, Procedures (TTP) development.					
FY 2016 Accomplishments: NWDC, responsible for the planning, execution, and assessment of fleet experimentation, used Project 2356 funding for naval warfare subject matter expertise, experiment execution expertise, and analysis expertise to conduct experimentation on emerging warfighting capabilities as identified by CUSFF/CPF. This same team also served to integrate tactical/operational level experimentation campaign efforts with the Navy's Warfighting Development Centers (WDCs) in support of advanced cross domain warfighting and maritime command and control (C2) lines of operation. For Fleet Experimentation FY16 Fleet Experimentation was based on four USFF/CPF directed focus areas to include, in very broad terms, Electromagnetic Maneuver Warfare, Naval Integrated Fires, Mine Warfare, and Unmanned Systems.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Additionally, experimentation was conducted in connection with the introduction of new platform capabilities. NWDC planned, executed and assessed the following 2016 experimentation efforts: KRYSTAL SPHINX At-Sea Experiment * This at-sea effort to examine the warfighting utility of a classified prototype addressing a Fleet urgent operational need was completed in the Virginia Capes operating area 08-11 March 2016. The experiment collected data from 58 aircraft test runs conducted over two days. * Fourteen personnel from the following commands participated in the experiment: U.S. Fleet Forces Command, Navy Warfare Development Command, U.S. Naval Research Laboratory, U.S. Sixth Fleet, Naval Expeditionary Task Force, Europe and Africa (CTF 68), Navy Information Operations Command Norfolk. * A classified quicklook of the experiment is available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal. The Final Experiment Report will be delivered in August 2016. EMW Technical War Game (Spectral Tsunami 16) * The Spectral Tsunami 16 war game, completed 07-10 March 2016 in Quantico, VA, provided a venue to obtain and characterize the cognitive aspects of mission planning from Fleet operators, with specific emphasis on the C2 and synchronization of Integrated Fires. * Following completion, the game output was injected into NWDC's Naval Simulation System (NSS) for advanced modeling and simulation (M&S) to quantify the tactical and operational impacts of various proposed science and technology solutions and innovative employment methods. * A classified quicklook and Final Experiment Report with multiple DOTMLPF change recommendations are available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal. Logistics Force Assured C2 War Game * The war game, completed 21-24 March 2016 in the NWDC Navy Center for Advanced Modeling and Simulation (NCAMS), focused on the examination of logistics functions, processes, and capabilities and their possible vulnerabilities to cyber exploitation. * The results of this event, through the data collected, the final experiment report, and a draft operational logistics concept provide the Fleet with a better understanding of current logistics informational flow to include frequency, means and mode; an improved understanding of the vulnerability of logistic information on multiple nets; and an understanding of a proposed prioritization of logistic information. Additionally, alternatives to reduce logistic information vulnerabilities and understanding the impact to logistics functions as a result of reduced communications capability for each use case were provided. * A classified quicklook and Final Experiment Report with multiple DOTMLPF change recommendations are available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Fleet Battle Experiment EMW 2016 (FBX EMW 16) * The Fleet Battle Experiment EMW 2016 series of experiments leveraged at-sea venues to inform rapid development of EMW-related tactics, techniques, and procedures (TTPs) through the integration of fielded and emerging systems. * The first in the series, FBX 16-1, was completed during Carrier Strike Group Ten (CSG 10) Composite Training Unit Exercise (C2X) from 14-18 March 2016. Units supporting experimentation included USS DWIGHT D EISENHOWER (CVN 69), USS SAN JACINTO (CG 56), and USS STOUT (DDG 55). FBX 16-1 focused on two (of four) EMW objectives: Battlespace Awareness (BA) and Assured Command and Control (AC2). * A classified FBX 16-1 Quicklook is available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal. * FBX 16-2 was completed during USS DWIGHT D EISENHOWER'S deployment from 08-12 June 2016. Other participants included: USS SAN JACINTO (CG 56), USS MONTEREY (CG 61), and USNS BIG HORN (T-AO-198). FBX 16-2 focused on one (of four) EMW objectives: Assured Command and Control (AC2). Specific initiatives included: Optimizing Receive-Only Broadcasts and Managing Bandwidth Afloat. * FBX 16-3 was completed during joint exercise VALIANT SHIELD 2016 from 10-23 Sep 2016. Experimentation focused on EMW Assured Command and Control and Distributed Lethality. Specific initiatives included: Optimizing Receive-Only Broadcasts, Managing Bandwidth Afloat, Clutch Shot, and Joint Net-Enabled Weapons. Participants included: USS RONALD REAGAN (CVN 76), USS BONHOMME RICHARD (LHD 6), USS CHANCELLORSVILLE (CG 62), and USS GERMANTOWN (LSD 42). * The classified results of these three events will be documented in the FBX EMW 16 Final Experiment Report (with multiple DOTMLPF change recommendations) to be delivered by the end of 2016. Counter-Unmanned Aerial System (UAS) Ashore Demonstration * This two phase experiment was designed to examine the performance of two counter-UAS systems to inform the development of naval facilities Anti-Terrorism Force Protection (ATFP) Standard Operating Procedures. * Phase 1, a Drone Defender technology demonstration, was completed 06-07 Apr 16 at the ranges in Yuma, AZ. * Phase 2, a Persistent Ground Surveillance Tower (PGST) technology demonstration, was completed 11-15 Apr 16. * A classified Counter-UAS Demonstration Final Report is available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal. MDUSV Mission Analysis Workshop * The first prototype Medium Displacement Unmanned Surface Vessel (MDUSV), developed by DARPA, was delivered to the Navy in May 2016. The Office of Naval Research (ONR) signed a Memorandum of Agreement					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
(MOA) with DARPA to jointly fund an extended test phase of the MDUSV aimed at informing Navy acquisition decisions. MDUSV will be a multi-mission platform with modular payload capability initially trialing three specific payloads (ASW, MIW, and EW). * The workshop, completed at Commander, Third Fleet Headquarters from 01-02 June 2016, provided fleet subject matter experts an opportunity to examine potential missions a MDUSV could undertake. * 45 workshop participants from a variety of warfighting disciplines, split into two working groups, identified 302 suggested tasks for a MDUSV. The 302 tasks were assigned to 59 mission-like groups. * A classified Analysis Summary Reference Document will be delivered in August 2016. Mine Countermeasures (MCM) War Game * The MCM war game, completed 06-10 Jun 16 in the NWDC Naval Center for Advanced Modeling and Simulation (NCAMS), was the first of two FY16 war games that support an FY17 At-Sea Mine Warfare experiment. The goal of the game was to explore MCM operations using MCM adaptive force packages (AFPs) embarked aboard multiple alternative naval platforms (i.e. LCS, T-EPF, T-ESB) as well as current and near term MCM technologies and concepts to enhance MCM. * A classified quicklook is available on the SIPRNet Fleet Experimentation Information Management System (FIMS) web portal. The Final Experiment Report will be delivered in August 2016. TRIDENT WARRIOR 2016 * This large-scale, at-sea experiment was completed in conjunction with exercise RIMPAC 2016 from 16 Jun-08 Aug 16 in the Southern California and Hawaiian operating areas. * 36 individual experiment initiatives were executed to explore innovative solutions to fleet-identified gaps and evaluate the ability of new, emerging, and updated doctrine and technologies to improve military operations and address warfighter capability gaps by putting them at sea and in the hands of warfighters. * A quicklook report was delivered in August 2016, followed by a Final Experiment Report in September 2016. Health Services Support (HSS) War Game * Commander, U.S. Pacific Fleet (COMPACFLT), in collaboration with NWDC, hosted an HSS focused logistics war game on 29 Aug - 01 Sep 16 at Pearl Harbor, HI. The purpose of the game was to explore and examine HSS concept of support and capabilities in order to assess how the COMPACFLT maritime HSS plan supports warfighting plan execution. * A quicklook report was delivered in September 2016, followed by a Final Experiment Report in November 2016. USV Swarm II Demonstration					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
* SWARM II is the second event of a five event campaign executed by ONR (supported by NWDC) as part of the USV Autonomy Future Naval Capability (FNC) program. SWARM II consisted of an at-sea technical demonstration completed in Oct 16. A report of observation will be delivered in Nov 16. Unmanned Warrior * Unmanned Warrior 2016 was a United Kingdom (UK) hosted multi-national naval and industry technical demonstration and exercise event held at-sea in Oct 2016 in the vicinity of the UK. * NWDC leveraged the event to evaluate the Collaborative UUV Operations Tactical Memorandum (TACMEMO) - a product of the FY15 Collaborative UUV War Game. Radiant Delphi At-Sea * This classified experiment, completed at-sea in October 2016, examined the capabilities of a Navy Tactical Exploitation of National Capabilities (TENCAP) project in an operational, at-sea environment to determine the contribution it makes to Joint Integrated Air and Missile Defense. Netted Sensor War Game * As a continuation of a series of Netted Sensor FLEX efforts, NWDC completed a war game in October 2016 to examine the integrated employment of national, theater, and tactical C5ISR systems in support of effective maneuver and engagement in a long-range war at sea scenario. The outcome of the war game (supported by the conduct of three workshops) will inform the baseline for an at-sea netted sensor experiment in FY17. Mining War Game * In support of Mine Warfare, NWDC and CPF will conduct a mining war game from 15-17 Nov 2016 to explore options available to improve naval/joint mining capabilities. For Concept Generation/Concept Development * The Electromagnetic Maneuver Warfare (EMW) concept was endorsed by CUSFFC and CPF, and approved by the CNO in early FY 16. The EMW campaign plan guides implementation of the concept throughout the Fleet. * Analysis and information to update the Rail Gun Operating Concept (RGOC) was provided to Naval Sea Systems Command (NAVSEA 405) in early FY 16. * Operational Logistics Concept (OpLog). NWDC drafted a white paper and draft concept that describes a concept for conducting logistics in contested environments. The OpLog concept is currently at 4 star flag review. It's anticipated that after 4 star endorsement, it will be delivered to the CNO for approval early FY 17. * Littoral Operations in a Contested Environment (LOCE). Based on guidance provided by the CNO and CMC and an OPNAV/HQMC PLANORD, NWDC and Marine Corps Warfighting Lab (MCWL) jointly developed a draft LOCE concept for integrated naval operations in contested littorals. The joint writing team utilized a CNA					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0604707N / *SEW Architecture/Eng Support*	**Project (Number/Name)** 2356 / *Maritime Concept Generation & Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
sponsored wargame in Dec '15 as well as the Naval Service Game in Feb '16 to support concept development. This concept will provide innovative command and control and capability solutions for integrated sea control and power projection operations in contested littorals. The concept is currently under Navy and Marine Corps 3-4 star flag review before signature from CNO and CMC in FY 17. ***FY 2017 Plans:*** New FY 2017 experiment efforts through 2356; NWDC will continue to provide naval warfare subject matter expertise, experiment execution expertise, and analysis expertise to conduct experimentation on emerging warfighting capabilities as identified by CUSFF/CPF; identify fleet warfighting deficiencies through experimentation; identify and capture innovative solutions for fleet experiments that address prioritized fleet warfighting gaps; and identify suitable events to support the execution of the following Experimentation efforts: Electromagnetic Maneuver Warfare (EMW) Experimentation Campaign In accordance with the EMW Charter, the CNO has assigned responsibility to Commander, U.S. Fleet Forces Command to create and execute the Navy-wide campaign to achieve Navy's articulated EMW end state by 2020. Additionally, the charter assigns NWDC as the EMW Action Lead and the lead for the Concepts, Doctrine, and Experimentation Level of Effort (LOE). Throughout FY17, NWDC will conduct a series of events designed to synchronize and align experiment initiatives with EMW tasks to provide solutions to EMW capability gaps and to ensure development of doctrine and TTP is synchronized with the introduction of new technology and provides the Fleet and Fleet trainers with required doctrine tools at the tactical and operational levels. Specific events planned for FY17 include: Fleet Battle Experiment 2017 (FBX 17) At-Sea - FBX 17 will be a combination of workshops and at-sea events leveraging existing and standalone Fleet venues that will build towards an FY18 comprehensive at-sea experiment. At-Sea Experiment - This classified effort, planned for execution in late 2017, is a follow-on at-sea event to the table-top war game completed in 2016. Spectral Tsunami 2017 Seminar War Game - This effort is guided by an O-6 EMW working group, chaired by OPNAV N2N6F3, comprised of stakeholders from across the Navy to define the baseline warfighting scenario and existing technical capabilities to form an Integrated Technical Capabilities Baseline (ITCB). The war game will be used to identify areas of strengths and weaknesses, areas for improving operational effectiveness and hardware/software changes necessary to improve existing POR systems or suggest requirements for new capability.					

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
Independent Deployer Experiments - This effort will leverage FY17 deployments to conduct extended evaluations of emerging concepts, tactics, and/or technologies in the hands of fleet operators in an operational environment. Emerging Concepts Wargame(s) - This effort will employ one or more seminar wargames to examine emerging concepts such as Distributed Maritime Operations, Littoral Operations in a Contested Environment or Operational Logistics. Naval Integrated Fires (NIF) Experimentation Campaign The NIF Campaign is part of the USFF-directed multi-year campaign plan that began in 2013 to explore NIFC-CA capabilities, C2 decision-making, training, and CONOPS/TTP development and refinement. A comprehensive campaign methodology is required to synchronize delivery of all NIF DOTMLPF actions and to provide Navy leadership with insight into challenges and limitations associated with NIF. Specific events planned for FY17 include: Netted Sensors At-Sea Experiment - This at-sea experiment is the continuation of a series of efforts to examine the employment of multiple programs of record, prototypes, and current/developmental tactics, techniques, and procedures (TTPs) to fulfill the vision that "every platform is a sensor and every sensor is netted." TRIDENT WARRIOR 2017 (TW17) At-Sea Experiment - The TW17 experiment will execute in partnership with Commander, Third Fleet. The effort will evaluate technology and/or TTP-related initiatives to close warfighting gaps identified across multiple POM-18 Integrated Prioritized Capability Lists (IPCLs). TW17 will support OPNAV, SPAWAR, program offices, ONR, NRL, and others in the spiral development of prototype capabilities at sea and in the hands of warfighters. Bold Alligator 2017 At-Sea Experimentation - This effort will leverage the fleet assets and at-sea time associated with a major Atlantic fleet training exercise, Bold Alligator 2017, to explore innovative technologies and TTPs focused on improving naval amphibious warfighting capabilities at the operational and tactical levels of war. Red Nitrum At-Sea Experiment - This at-sea experiment is the continuation of a series of efforts to examine the impact of advanced electronic attack on Navy surface and air sensors and weapon systems. Full Spectrum Mine Warfare (MIW) Experimentation Campaign * The MIW Campaign is part of the USFF-directed multi-year campaign plan to examine U.S. and coalition emerging technologies and TTP to improve full detect-to-engage MCM capabilities and reinvigorate Navy and Joint mining capability. Specific events planned for FY17 include: MIW At-Sea Experiment - This at-sea experiment will examine selected innovative technologies and TTPs enabling capabilities in an operational environment to support the transition of MIW capabilities from legacy manned platforms to future unmanned systems. Unmanned Systems (UxS) Experimentation Campaign					

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
The UxS Campaign is part of the USFF-directed multi-year campaign plan focused on leveraging and integrating unmanned systems and TTP development/improvement to support offensive and defensive actions. Specific events planned for FY17 include: Counter Unmanned Systems (UxS) Experiment - This event will focus specifically on Navy capabilities and limitations to detect, track, and counter adversary unmanned systems. Unmanned Systems Experiment - This event will examine the capabilities of various unmanned systems and associated tactics, techniques, and procedures to contribute to multiple naval missions and close identified warfighting gaps. Specific areas of interest include, but are not limited to: persistent ISR, intelligence preparation of the environment, C2 of UxS, employment of armed UxS, UxS in support of SUW, ASW, and MIW. Office of Naval Research (ONR) Technology Innovation Games (TIGs) - This series of smaller, iterative analytical workshops will be conducted in partnership with ONR to better inform naval strategy development, campaign analysis, and at-sea fleet experimentation. Specific workshops include: Low Cost UAV Swarming Technology (LOCUST) concepts of employment, Medium Displacement USV (MDUSV) ASW payload employment, and Unmanned System (UxS) force protection. For FY 17 Concept Generation/Concept Development * Continue CG/CD development efforts that carry-over from FY 2016: * Operational Logistics Concept (OpLog). NWDC drafted a white paper and draft concept that describes a concept for conducting logistics in contested environments. The OpLog concept is currently at 4 star flag review. It's anticipated that after 4 star endorsement, it will be delivered to the CNO for approval early FY 17. * Littoral Operations in a Contested Environment (LOCE). Based on guidance provided by the CNO and CMC and an OPNAV/HQMC PLANORD, NWDC and Marine Corps Warfighting Lab (MCWL) jointly developed a draft LOCE concept for integrated naval operations in contested littorals. The joint writing team utilized a CNA sponsored wargame in Dec '15 as well as the Naval Service Game in Feb '16 to support concept development. This concept will provide innovative command and control and capability solutions for integrated sea control and power projection operations in contested littorals. The concept is currently under Navy and Marine Corps 3-4 star flag review before signature from CNO and CMC in FY 17. * Distributed Maritime Operations (DMO). NWDC will lead the development of the DMO concept and doctrine in support of USFFC overall Fleet Design concept. ***FY 2018 Base Plans:*** New FY 2018 experiment efforts through 2356; Navy Warfare Development Command (NWDC) will continue to provide experiment, analytical and naval mission subject matter expertise support throughout the planning and execution process; identify fleet warfighting deficiencies through experimentation; identify and capture					

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
innovative solutions for fleet experiments that address prioritized fleet warfighting gaps; and identify suitable events to support the execution of the following Experimentation Campaigns: Fleet Design Campaign * Continuing the development of the supporting doctrine, TTP, Command and control (C2) as well as the integration and interoperability required between weapon systems and decision makers requires a methodical experimental approach. FY 18 experiments (both at-sea and via war games) will strive to achieve the objectives as laid out in the accompanying action/implementation plan. EMW Experiment Campaign / Naval Integrated Fires Campaign * NWDC will conduct multiple events designed to synchronize and align experiment initiatives with EMW tasks to provide solutions to EMW capability gaps and to ensure development of doctrine and TTP is synchronized with the introduction of new technology and provides the Fleet and Fleet trainers with required doctrine tools at the tactical and operational levels. Specific events currently planned for FY18 include: * Fleet Battle Experiment EMW (FBX 18). FBX 18 will consist of a large, free play-based event focused on an assessment across the EMW objective areas. The primary focus of this effort will be to revise and validate the contents of existing and newly developed EMW-related doctrine, TTP, and CONOPS. * EMW Technical War Game (Spectral Tsunami 18-1). Spectral Tsunami 18-1 is the last in a series of war games planned to evaluate the individual and cumulative effects of emerging capabilities in vignette-based scenarios and to enable operators to work side-by-side with technology developers to identify ways to close capability gaps in an effort to reach the articulated EMW 2020 endstate. Unmanned Systems Experimentation * This effort will be conducted to examine (via both at-sea events and war game / workshop venues) not only the warfighting utility and multiple employment options offered by various types of unmanned systems in support of naval warfare missions but also the key enablers required to maintain and control these evolving systems for enduring missions. * Additionally, both at-sea and war game / workshop venues will be used to refine our abilities to counter UxS as it applies across the breadth of naval missions. * Emerging Concepts Wargame(s) - This effort will employ multiple seminar wargames to examine emerging concepts such as Distributed Maritime Operations, Littoral Operations in a Contested Environment or Operational Logistics. * Trident Warrior 2018 At-Sea Experiment. The TRIDENT WARRIOR 2018 (TW18) experiment will execute in partnership with a numbered fleet commander. The effort will evaluate technology and/or TTP-related initiatives					

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
to close warfighting gaps identified across multiple Integrated Prioritized Capability Lists (IPCLs). TW18 will support programs in the spiral development of prototype capabilities at sea and in the hands of warfighters. Mine Warfare * FY 18 efforts will continue to examine TTP and C2 construct for our future MCM force as programs of record and unmanned systems come on line through workshops/ war games and at-sea events. For FY 18 Concept generation/Concept Development * Continue CG/CD development efforts that carry-over from FY 2017: * In support of USFFC, NWDC tasked to development enabling concepts for Fleet Design. This includes development of Distributed Maritime Operations concept (DMO). ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.268	8.320	6.452	0.000	6.452

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The vast majority of this funding is used to acquire intellectual capital in emerging conceptual and technical areas through contracts providing expertise in concepts and experiment design, execution and analysis to mitigate fleet-identified current and future war fighting gaps.

E. Performance Metrics

Maritime Concept Generation and Development/Related Experimentation:
- Integrate emergent concepts and technologies, leading to rapid introduction of needed war fighting capabilities in the fleet.
- Rapidly mature concepts, technologies, and doctrine.
- Develop near-term doctrine solutions to address specific fleet-identified tactical level / operation level issues
- Develop recommended Doctrine, Organization, Training, Materiel, Leadership, and Personnel (DOTMLP) changes required to introduce emergent technology and tactics.
- Refine concepts and identify key performance levels necessary for implementation.
- Demonstrate feasibility and discriminate among competing concepts and implementation alternatives.
- Identify potential military effectiveness and risk.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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- Evaluate how much of the new capability and attendant force structure is needed.
- Identify how to operate the new force and combine it with the legacy force.
- Focus on near, mid and long term war fighting challenges to realize increased war fighting effectiveness.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / *SEW Architecture/Eng Support*	Project (Number/Name) 3319 / *Fleet Experimentation*	

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
3319: *Fleet Experimentation*	50.794	8.543	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	59.337
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY17, project 3319 moved to PE 0606355N.

A. Mission Description and Budget Item Justification

The Fleet Experimentation (FLEX) program examines the doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) solutions to identified warfighter capability gaps within the FYDP. The FLEX program considers warfighting gaps identified in: Integrated Prioritized Capability Lists (IPCL) generated by Warfighting Development Centers (WDC) through the warfare improvement program; USFF/CPF's Integrated Priorities Letter (IPL) delivered annually to the CNO; USFF/CPF's Commanders' FLEX Guidance; and Navy and Joint Urgent Operational Needs Statements. In addition, FLEX addresses innovative concepts, and tactics, techniques, and procedures (TTP), and Fleet Concepts of Operation (CONOPS) that collectively mitigate Fleet-identified warfighting capability gaps as defined by Commander, U.S. Fleet Forces' (CUSFF)/Commander, Pacific Fleet's (CPF) annual FLEX guidance. Through experimentation activities such as workshops, system or seminar war games, live at-sea events, and experimentation campaigns, the FLEX program examines potential materiel and non-materiel tangible solutions that will enhance the Fleet's ability to execute assigned missions. FLEX events and campaigns are comprised of all facets of experimentation including design, planning, systems engineering and integration, execution, data collection, analysis, assessment, and the delivery of tangible products to the fleet. While Navy-centric, FLEX efforts include joint, coalition, Science and Technology (S&T), academia, and industry partners.

Experimentation is vital to continuously improving naval warfighting capabilities. As such, the FLEX program directly supports four of the five elements outlined in the Secretary of the Navy's Innovation Vision: Build the Naval Innovation Network, Improve the Use of DON Information, Accelerate Emerging Operational Capabilities to the Fleet, and Develop Game-Changing Warfighting Concepts. In accordance with the joint CUSFF and CPF FLEX instruction, the FLEX program is the conduit to conduct experimentation using operational fleet assets. As such, the FLEX program, and associated efforts of the FLEX team, provides critical support to achieve the "last tactical mile" of Navy and S&T programs. This "last tactical mile" support is delivered through "at sea" or "salt-water" testing and experimentation at the point when the technology is sufficiently mature and requires evaluation using a fleet asset - ships, airplanes, submarines, networks, and/or sailors.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Fleet Experimentation	8.543	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: FLEX is a USFF/CPF collaborative effort to address fleet prioritized capability gaps, led by USFF N8/N9, supported by Navy Warfare Development Command (NWDC), and coordinated with Naval Component Commands (NCC)/Numbered Fleets, Type Commanders (TYCOM), Systems Commands (SYSCOM), OPNAV,					

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
Services, Coalition, and Science & Technology (S&T) community. The Fleet Experimentation program objective is to produce recommended changes in doctrine, organization, training, materiel, leadership development, personnel, facilities, and policy (DOTMLPF-P) actions. Deliverables are focused on operational and tactical warfighting capability in the near term (within the Fiscal Year Defense Plan), and prioritized by the Commander, U.S. Fleet Forces (USFF)/Commander, Pacific Fleet (CPF) Fleet Experimentation annual guidance. NWDC plans and executes USFF/CPF approved multi-year Fleet experimentation campaigns and final reports. USFF/ CPF staff manage the follow-on DOTMLPF-P actions with OPNAV, SYSCOMs, TYCOMs and Warfighter Development Command (WDC) staffs to establish or enhance warfighting capability in Integrated Air and Missile Defense (IAMD), Amphibious Warfare (AMW), Surface Warfare (SUW), Strike Warfare (STW), Anti-Submarine Warfare(ASW),Expeditionary Warfare (EXW), Information Dominance (ID), Mine Warfare (MIW) and Anti-Terrorism/Force Protection (AT/FP). - The Operational venue to experiment, demonstrate, assess warfighting CONOPS development, concepts, doctrine/training development, techniques and procedures (TTPs), and technologies - Multi-year experiment campaigns focuses on warfighting capability per CPF/CUSFFC guidance to evaluate and transition to DOTMLPF-Policy change recommendations: - Trident Warrior is the component of FLEX that specifically targets C4I systems ***FY 2016 Accomplishments:*** The FY16 FLEX ExPlan is based on four USFF/CPF directed focus areas: Multi-mission Electromagnetic Maneuver Warfare, Naval Integrated Fires, Full Spectrum Mine Warfare, and Unmanned Systems. Additionally, FLEX supported the introduction of new platform capabilities. FLEX ExPlan for FY 2016 included the following events: 1. Naval Integrated Fires (NIF) Campaign 3 Non-Kinetic War Exercise Project 3319 provided funds for Modeling and Simulation support required for the Naval Integrated Fire Control-Counter Air (NIFC-CA) From the Sea (FTS) and From the Air (FTA) Kill Chain; and NIFC-CA Collateral Capability I (N-CCI). Funds were also provided for the non-kinetic operator-in-the-loop (OITL) system wargame completed in November 2015. 2. Electromagnetic Maneuver Warfare (EMW) Experiment Campaign Project 3319 provided funds for series of EMW events to include:					

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
Fleet Battle Experiment 2016: Funds provided for the analysis support of a Classified experiment aboard a naval vessel EMW Technical War Exercise (Spectral Tsunami 16-1): Funds were provided for the war exercise conducted 07-10 March 2016 in Quantico, VA; Classified quicklook report available via SIPRNet. KRYSTAL SPHINX (KS): Funds were provided for analysis support to examine KS effectiveness. A three-phased at-sea experiment was conducted in the vicinity of the Virginia Capes Operation Area in the W-72 corridor. Results provided to C6F to inform CONOPS/TTP. Situational Awareness System (SAwS): Funds were provided to include: Evaluation of potential electro-optic/ infrared (EO/IR) sensors, software integration with DDG81 surface search RADAR, and EO/IR sensors. TTX War Exercise: The TTX examined and refined the authorities, planning/coordination requirements, and employment considerations related to an emerging EMW capability. Funds were provided for technical and engineering, analysis, certification and accreditation, range and target support for efforts related to EMW to include Blue Emitter Vulnerability Analysis (BEVA),and High Frequency (HF) Low Probability of Intercept (LPI) limited objective experiment. 3. Logistics Force Assured C2 War Exercise Project 3319 provided funds for subject matter expertise support which examined logistics functions, processes and capabilities. The objectives and results of the war exercise are classified. 4. Trident Warrior (TW) 2016 At-Sea Experiment TW is a Fleet-directed operational experiment conducted using platforms both afloat and ashore. The systems and technologies targeted for installation aboard naval vessels are required to comply with administrative approval procedures, such as Fleet Readiness Certification Board (FRCB), and Certification and Accreditation (C&A) process. Project 3319 provided funds for the Certification and Accreditation of the nineteen approved initiatives for the 2016 Trident Warrior at-sea experiment event; and for a test facility to integrate synthetic technologies. 5. Expeditionary Fast Transport (T-EPF) At-Sea Experiment					

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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
Project 3319 provided funds for the installation, integration, and testing of components/systems required to develop Common Operational Picture (CTP) within the Command Operations Center (COC) and sharing of data between T-EPF1 SPEARHEAD COC and an Operations Center to support the Intelligence Surveillance Reconnaissance (ISR) Adaptive Force Package (AFP) composition. Results will be incorporated into the AFP CONOPS. 6. Project 3319 provided funds for technical and subject matter expertise support throughout the experiment planning, execution, and analysis process for the following FLEX events/campaigns/wargames executing from June thru September of FY2016: -Unmanned System Series of Events -Mine Counter Measure (MCM) Exercise -VIRTUOSO War Game -Navy Tactical Data Network At-Sea Experiment -Undersea Domain Operating Concept (UDOC) At-Sea 2016 -Health Services Support Logistics War Exercise -Netted Sensor System War Exercise -Naval Mining War Exercise ***FY 2017 Plans:*** Starting in FY 2017, Fleet Experimentation is realigned to PE 0606355N Warfare Innovation Management ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	8.543	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Fleet Experimentation is a non-acquisition program.

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E. Performance Metrics

Fleet Experimentation MOP:
FLEX supports approximately 100 experimental initiatives annually address fleet identified capability gaps. The majority of this funding is applied toward acquiring intellectual capital in emerging technical areas through contracts providing engineering expertise, experiment design, execution and analysis support, range support, certification and accreditation of technical capabilities, targets, and supporting air assets, and it is also used to acquire engineering and integration costs associated with conducting campaign-based experiments.

Fleet Experimentation MOE:
- CNO/CUSFF/CPF directed experiment for emerging future capability
- Mitigate critical capability gaps
- Inform Doctrine TTP, and training
- Inform Fleet Platform Wholeness or Warfighter CONOPS validation
- Impact to Fleet Warfighting within the FYDP