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 0603725N *I Facilities Improvement*							
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	9.470	3.726	5.458	2.837	-	2.837	4.024	3.970	3.800	3.814	Continuing	Continuing
0995: *Naval Facilities System*	6.615	1.154	2.066	1.786	-	1.786	2.252	2.254	2.221	2.228	Continuing	Continuing
3155: *Force Protection Ashore*	2.369	0.575	1.230	1.051	-	1.051	1.772	1.716	1.579	1.586	Continuing	Continuing
3347: *Navy Expeditionary Energy Development*	0.486	1.997	2.162	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.645

A. Mission Description and Budget Item Justification

Mission Description and Budget Item Justification:

This program provides for capabilities to: a) overcome performance limitations and reduce the life cycle cost of shore facilities and, b) provide protection against terrorist attacks for shore installations and their operations. The program focuses on technical and operational issues of specific Navy interest, where there are no unbiased test validated Commercial Off the Shelf (COTS) solutions available, and where timely capabilities may not materialize without specific demonstration or validation by the Navy. Additionally, the program completes the development of technologies originating from Navy, DOD and other sources of Science and Technology programs, including the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) and Department of Energy (DOE). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization (FSRM) program, and Antiterrorism and Force Protection (ATFP) Other Procurement, Navy (OP,N) program.

Project 0995 addresses the following Navy facilities requirements during FY 2014 through FY 2020: Advance Technology for Waterfront Facilities Repair and Enhancements, Facilities Technologies to Reduce the Cost of Facilities Sustainment, Restoration and Modernization for reducing the total ownership cost (TOC) of future and existing Facilities and addressing natural and catastrophic risk of critical Naval Waterfront Facilities. This project is consistent with recommendations of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities."

Started in FY 2006 the Force Protection Ashore Project 3155 addresses selective topics in modeling, and material technologies to reduce the vulnerability of installations; and reduce the acquisition and operating costs of protective technologies. The demonstrations and validations provide the independent, technical and operational test data for the development of competitive performance specifications to acquire the required capabilities. The ATFP project is coordinated with other DOD programs.

Project 3347: The Development of advanced Environmental Control Unit (ECU) for expeditionary force camp shelters project is a transition of a DOE FY12-14 funded project and is a continuation in technology development, and was transitioned to NAVFAC starting FY 2015.

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 0603725N *I Facilities Improvement*			
B. Program Change Summary ($ in Millions)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Previous President's Budget	3.726	5.458	3.772	-	3.772
Current President's Budget	3.726	5.458	2.837	-	2.837
Total Adjustments	0.000	0.000	-0.935	-	-0.935
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-0.607	-	-0.607
• Rate/Misc Adjustments	0.000	0.000	-0.328	-	-0.328

Change Summary Explanation

The FY 2018 funding request was also reduced by $0.607 million to account for the availability of prior year execution balances.

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 0603725N / *Facilities Improvement*				Project (Number/Name) 0995 / *Naval Facilities System*			
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**
0995: *Naval Facilities System*	6.615	1.154	2.066	1.786	-	1.786	2.252	2.254	2.221	2.228	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides the Navy with new engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available RDT&E resources on satisfying facility requirements where the Navy is a major stakeholder or where there are no tested validated Commercial Off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy science and technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities Sustainment Restoration and Modernization Programs (FSRM). The Duncan Hunter National Defense Authorization Act of 2009 laid down very specific guidelines for the correction of corrosion deficiencies in DoD shore facilities which is estimated to be $1.9B (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010).

Project 0995 addresses two Navy facilities requirements: 1) waterfront facilities repair, upgrade and service life extension; and, 2) validation testing/performance monitoring of critical facilities (such as dry docks, piers, runways, magazines, etc.), testing and evaluation of the performance of alternative materials, and surfacing concepts, and, methods and corrosion technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM).

Waterfront facilities, repair, upgrade and service life extension:
An urgent requirement exists for early identification of strategies and solution recommendations for seismic risk at Naval Facilities, and especially nuclear capable waterfront facilities. Recent Pacific Rim earthquakes have heightened anxiety levels on perceived huge risks to Navy waterfront facilities in the region. The sub-project will provide analysis and solution recommendations for facilities impacted by seismic risk. Waterfront facilities repair and upgrade: About 75% of the Navy's waterfront facilities are over 45 years old. They were designed for a service life of 25 years which was to satisfy the mission requirements existing at that time. The over aged reinforced concrete requires costly and repetitive repairs. Besides providing more pier side ship maintenance and thus reduce dry dock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons when piers were originally not designed for concentrated loads. Piers were previously designed to service one or possibly two particular ship classes. Berthing flexibility is now limited by mooring and utility arrangements. This sub-project addresses new material design methods, and retrofit methods which extends the service life of existing waterfront facilities by an additional 15 or more years. The project also addresses updating the mission based service, environmental, and protection loading requirements imposed by changes in platforms, operations and threats. Other initiatives include: leveraging Building Information Modeling (BIM) technology to provide for enhanced facilities management processes and waterfront utilities service enhancements using models to achieve flexible berthing arrangements consistent with current and future platform mooring configurations and hotel service requirements including Facilities and Infrastructure Integrated Product Support for Acquisition Category (ACAT) Programs.

Technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM):
Technologies to reduce the cost of SRM issues of high operational significance are addressed on a priority basis. The Navy portion of corrosion deficiencies at DoD shore facilities is estimated to be $433M (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010). This effort will

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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

demonstrate and validate the cost and reliability of advanced corrosion technologies in order to assure their acceptance and implementation in traditionally conservative public works and construction industries. These facility corrosion technologies will accelerate the validation commercialization, and wide-spread implementation required to reduce the cost of correcting, the deficiencies in the Navy SRM backlog. The sub-projects include the continuing effort to validate, test and conduct performance monitoring of enhanced facility designs and coatings for facilities and equipment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Waterfront facilities, repair, upgrade and service life extension:	0.300	0.807	0.707	0.000	0.707
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Completed waterfront seismic analysis and standard seismic risk mitigation procedures for a CVN/Ship in dry-dock. Continue to identify and validate operational and maintenance issues of waterfront facilities associated with supporting the Navy's new class of ships and submarines, including the Ohio Class Replacement Submarine. Continued with performance enhancement of small floating piers. Completed tsunami load and effects on critical navy waterfront structures. Initiated Sea Level Rise effects on Navy waterfront structures.					
FY 2017 Plans: Complete Ultra High Performance Concrete for Structural Repairs and Modular Construction: Identify where to use ultra-high performance concrete (UHPC) for repairs. Test and evaluate repair methods for cost and durability. Findings will transition into unified criteria. Continue Floating Pier Eval hydrodynamics: Conduct failure analysis and develop retrofit methods for floating piers. Conduct field tests of retrofit methods to confirm analysis. Findings will transition into unified criteria. Continue Engineered Cementitious Composite (ECC) for Reinforced Concrete Repairs: Test and evaluate the use of ECC in highly corrosive environments as a repair material for reinforced concrete structures. Findings will transition into unified criteria. Continue Structural numerical joint Analytics: Build numerical models of structural joints subject to wave and tidal motions such as those found in dry docks, piers and wharves. Use models to improve joint design through dynamic analysis and model refinement. Findings will transition into unified criteria. Initiate Sea Level Rise effects on Navy waterfront structures: Use existing forecasts of sea level rise as a basis for modelling wave, tidal and storm surge effects on structures. Model mitigation measures and analyze cost-benefit to identify most effective retrofit methods and 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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Initiate autonomous inspection technologies and systems for waterfront facilities: Define requirements for autonomous inspection technology including use below the waterline. Identify autonomous technologies and systems to test against requirements. Test and evaluate technologies. Findings will transition into unified criteria.					
FY 2018 Base Plans: FY18 Plans to include: -Initiate High Altitude Electro Magnetic Pulse (HEMP) hardening project for Navy Ocean Cable Shore Facilities: This project will develop defensive measures, referred to as hardening, against the potential use of HEMP above Waterfront Facilities Systems An electromagnetic pulse (EMP) is a burst of electromagnetic radiation created by a specially designed and deployed explosion. When that explosion is set off at a high altitude, it is referred to as a HEMP. As an offensive weapon, a HEMP is deployed to render inoperable all electronic equipment subject to its burst of electromagnetic radiation. [$92K] -Initiate investigation into Fluid Induced Vibrational (FIV) Degradation and Augmented Reality (AR) systems. [$20K] -Continue Floating Pier Evaluation hydrodynamics: Conduct failure analysis and develop retrofit methods for floating piers. Conduct field tests of retrofit methods to confirm analysis. Findings will transition into Unified Facilities Criteria (UFC) Project, in accordance with the DoD Instruction 4120.24. [$162K] -Continue Engineered Cementitious Composite (ECC) for Reinforced Concrete Repairs: Test and evaluate the use of ECC in highly corrosive environments as a repair material for reinforced concrete structures. Findings will transition into Unified Facilities Criteria (UFC) Project, in accordance with the DoD Instruction 4120.24. [$109K] -Continue Structural numerical joint Analytics: Build numerical models of structural joints subject to wave and tidal motions such as those found in dry docks, piers and wharves. These Use models to improve joint design through dynamic analysis and model refinement. Findings will transition into Unified Facilities Criteria (UFC) Project, in accordance with the DoD Instruction 4120.24. [$162K] -Continue Sea Level Rise effects on Navy waterfront structures: Use existing forecasts of sea level rise as a basis model wave, tidal and storm surge effects on structures. Model mitigation measures and analyze cost-					

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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
benefits to identify most effective retrofit methods and systems, vice replacing the entire waterfront system. [$162K] ***FY 2018 OCO Plans:*** N/A					
Title: Sustainment, Restoration & Modernization:	0.854	1.259	1.079	0.000	1.079
Articles:	-	-	-	-	-
FY 2016 Accomplishments: The projects continued from FY15 are: Completed Corrosion Prevention & Control projects, emphasized sustainable design and improved lifecycle cost reductions. Completed high temperature pavement design mix optimization to improve cost, performance, and integration with other new aviation platforms. Completed seismic analysis of Earth Covered Magazines (ECM). Completed verifying the effectiveness of vapor phase corrosion inhibitors in protection of aboveground storage tanks.					
FY 2017 Plans: Complete Viscous Elastic Coatings: Evaluate cost effectiveness and durability of coatings to protect fuel and utility pipelines against corrosion. Findings will transition into unified criteria. Complete Durable Concrete Repairs: Evaluate cost effectiveness and durability of coatings to protect reinforced concrete against corrosion. Findings will transition into unified criteria. Complete Verifying the Effectiveness of Vapor Phase Corrosion Inhibitors (VpCI) in Protection of Aboveground Storage Tanks: Evaluate VpCI probes and conduct validation testing. Findings will transition into unified criteria. Complete Water Storage Tank Galvanic Anode Cathodic Protection Controller: Evaluate galvanic anode cathodic protection (GPC) systems at selected installations for cost, installation, performance and durability. Analyze results and recommend performance specifications for GPC systems. Findings will transition into unified criteria. Initiate analysis of Additive Manufacturing (AM) capabilities for facilities and infrastructure for both new and existing assets: Investigate existing and projected applications of AM to facilities and infrastructure. Define					

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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 0995 / *Naval Facilities System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
requirements for AM technology applications. Procure and evaluate AM technology against requirements in developmental and operational tests. Findings will transition into unified criteria. ***FY 2018 Base Plans:*** FY18 Plans to include: -Initiate Unmanned Systems for the Facilities Inspection and Design Reconstruction. The unmanned system will provide the necessary data processing, sensors, automatic control and communications in order to initiate autonomous systems to support Facilities Inspection Programs to include Airfield Pavements, Petroleum Oil Lubricant (POL) Facilities, Tall Towers, Roofing, etc. The autonomous nature of this technology will significantly increase inspection and design efficiency via faster execution and lower labor costs. [$307K] -SPIDERS 3D Asset Component Date project for development of Augmented Reality (AR) facilities and Geographic Information System (GIS). The SPIDERS 3D visualization design process allows collaboration among Fleet, and Shore and Facility stakeholders in separate locations to more easily participate in the planning evolutions of new ships and aircraft. The SPIDERS 3D reviews reflect the latest platform design concept manipulated "live" for all collaborators in scenes consisting of both real and notional shore support facilities and infrastructure. [$367K] -Continue analysis of Additive Manufacturing (AM) capabilities for facilities and infrastructure for both new and existing assets: Investigate existing and projected applications of AM to facilities and infrastructure. Define requirements for AM technology applications. Procure and evaluate AM technology against requirements in developmental and operational tests. Findings will transition into unified facilities criteria. [$405K] ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	1.154	2.066	1.786	0.000	1.786

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Projects identified in this budget have been carefully selected to respond to both the facilities support for new Acquisition Category Programs, to address TOC considerations of an evolving and aging infrastructure, and to facilitate rational risk based decisions and solutions to protect and decrease risk levels for Department of

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
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the Navy-critical infrastructure and facilities. Each project has been assessed to ensure that it is addressing legitimate risks and requirements of the shore establishment. The results of these projects will be the development of design and construction criteria and or components that directly impact the shore facilities.

E. Performance Metrics

Quarterly Program Reviews are conducted with the major performers to include funds status discussion, schedule review, assessment of plan to actual to meet benchmarks at midyear and end-of-year for PY1 and CY, and review of accomplishments and issues to date.

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 0603725N / *Facilities Improvement*	Project (Number/Name) 3155 / *Force Protection Ashore*	

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
3155: *Force Protection Ashore*	2.369	0.575	1.230	1.051	-	1.051	1.772	1.716	1.579	1.586	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Protection of Navy installations against terrorist activities requires deployment of advanced technology for force protection capabilities. This antiterrorism and force protection (AT/FP) ashore project will develop, demonstrate and validate technologies for the following: access control and integrated perimeter security surveillance sensors and intelligent electronic security systems for automated intruder detection (Installation Protection); perimeter security; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency management centers including human and information support systems (Command and Control). Programs currently being evaluated are, standard-based enterprise physical security system integration and automation; Command, Control, and Communications (C3) capabilities for emergency operations; integrated and networked mass notification systems (MNS); Waterside intelligent video security systems; integrated over-the-water sensors and analytics for automated course of action planning; identifying and interdicting malevolent threats - watercraft, swimmers, divers, and unmanned underwater vessels (UUVs) to reduce injury and death to the warfighter and damage to high value units (HVUs)(Waterside Protection). Through demonstration and validation of risk modeling and simulation models, the potential of emerging technologies will be evaluated and installation security strategies that reduce manpower and other costs will be formulated. These demonstrations and validations derive advanced technology from science and technology programs of government academia and industry. The technology evaluation and validation produces data for performance specifications used for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Force Protection Ashore	0.575	1.230	1.051	0.000	1.051
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Funds supported: - Completed ship-to-shore common information exchange project, focusing on integration of a prototype system with a representative EHSS installation and testing in a controlled test environment. - [$163K] - Developmental Test & Evaluation (DT); NSWC - Panama City - Completed versatile access control project to integrate and test an enhanced access control approach, leveraging multiple credential types, biometrics and enhancing the detection of vehicles and personnel in and around an Access Control Point. - [$225K] - Developmental Test & Evaluation (DT); NSWC-Dahlgren - Completed Waterside Protection - Boat Barrier Electronic Infrastructure project to assess EHSS performance, environmental, and operational impact and added benefits of next generation boat barriers. - [$150K] - Operational Test & Evaluation (OT); SSC-PAC					

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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Completed the integration and demonstration of Automated Sensor Assessment and Course of Action Plan (COAP) with EHSS and document baselines specifications. [$37k]- Spiral Development; SSC: PAC					
FY 2017 Plans: Funds will support continued and initiated projects from FY15 and FY 16 as follows: -Complete Waterside Protection - Boat Barriers project to access performance, environmental, and operational impact and added benefits of next generation boat barriers. -[$267K] - Operational Test & Evaluation (OT); CTTSO -Initiate Installation Protection Capability Development - Airborne Threat project to detect, assess and clasisify for the defense against full-scale and man-deployable airborne threats (e.g., UAV, drones, remote-control [R/C] platforms. - [$538K] - Developmental Test & Evaluation (DT); SSC-PAC -Initiate Command and Control Capability Development Virtual Field Support project to improve efficiency, effectiveness and reliability of the recovery of operational availability during critical system failures (corrective maintenance) and specialized routine maintenance (preventive maintenance). - [$425K] - Developmental Test & Evaluation (DT); NSWC Dahlgren					
FY 2018 Base Plans: FY 2018 Base Plans: Funds will support continued and initiated projects from FY16 and FY17 as follow: - Continue Installation Protection Capability Development - Airborne Threat project to detect, assess and classify for the defense against full-scale and man-deployable airborne threats (e.g., UAV, drones, remote-control [R/C] platforms. - [$375K] - Developmental Test & Evaluation (DT); NAWCAD - Continue Command and Control Capability Development Virtual Field Support project to improve efficiency, effectiveness and reliability of the recovery of operational availability during critical system failures (corrective maintenance) and specialized routine maintenance (preventative maintenance). - [$271K] - Developmental Test & Evaluation (DT); NSWC Dahlgren - Continue Waterside Protection - Boat Barriers project to access performance, environmental, and operational impact and added benefits of next generation boat barriers using bidirectional technology. - [$405K] - Developmental Test & Evaluation (OT); CTTSO					
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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3155 / *Force Protection Ashore*

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	0.575	1.230	1.051	0.000	1.051

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.

E. Performance Metrics

Quarterly program reviews to include funds status, schedule review and assessment of plan to actual.

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 0603725N / *Facilities Improvement*	Project (Number/Name) 3347 / *Navy Expeditionary Energy 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
3347: *Navy Expeditionary Energy Development*	0.486	1.997	2.162	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.645
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Development of advanced Environmental Control Unit (ECU) for expeditionary force camp shelters will reduce the heating and air-conditioning (HVAC) fuel consumption by 50% and also will reduce fuel transport convoys, and attendant manpower casualties and handling labor.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Expeditionary Environmental Control Unit (EECU)	1.997	2.162	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2016 Accomplishments: - Develop, design, and fabricate full scale prototypes (TRL 7) for technical and operational testing. One prototype is for an ECU utilizing the exhaust heat from generators which is currently wasted. Second prototype is for a new ECU based on Sterling cycle technology which is projected to reduce energy consumption by 30%.					
FY 2017 Plans: Perform technical and operational testing on the prototypes. Prototypes represent technology which will (1) utilize exhaust heat and (2) utilize the Sterling cycle technology.					
FY 2018 Base Plans: N/A					
FY 2018 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	1.997	2.162	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 0603725N / *Facilities Improvement*	**Project (Number/Name)** 3347 / *Navy Expeditionary Energy Development*

D. Acquisition Strategy

Development of this technology will continue in partnership with the Advanced Research Projects Agency-Energy (ARPA-E). The Navy is positioned to transition the technology into a procurement program once technologies are operationally test and accepted. Additionally, the Navy is pursuing methods to transition the program to the DoD Program Manager for Mobile Electric Power so that all of DoD can benefit from this latest generation, energy saving technology.

E. Performance Metrics

Quarterly Program Reviews will be conducted with the major performer to include cost, schedule, and performance risks for milestone achievement associated with the full scale prototypes