2010 Defense Standardization Program Award

Nomination Cover Page

1. Service/Agency: **NAVY**

2. Point of Contact Information:

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Narrative Description Page

Service or Agency: Navy Lead, Joint (USMC, USAF, USN)

Title of Project: ***Joint Counter Radio-Controlled Improvised Explosive Device (IED) Electronic Warfare (JCREW)***

Please provide information on each of the following topics. An explanation of what each topic should entail follows in italics. Please follow this format and do not exceed five pages.

DESCRIPTION *(in 200 words or less, give a brief summary paragraph of the accomplishment and payoff.)*

The JCREW will be **easily upgradeable** and use **open architecture, well defined and common standards**. The JCREW will be employed throughout the future operating environment, supporting U.S. Forces dominance over the electromagnetic spectrum, and will not require new or unique communications systems, but will **operate within the bandwidth and quality of service of current and future systems**. JCREW will be capable of functioning in a stand-alone mode (as do legacy systems) or in a networked mode. JCREW will be an incremental approach that is easily upgradeable and executable through incremental development and the use of open architecture and well defined, common standards. Current plans envision: 1) two-three year technology refresh updates, 2) a second incremental update four-six years after Initial Operational Capability (IOC), and 3) periodic technology insertions to account for obsolescence, and to counter the rapidly evolving threat. **JCREW SoS networking** in an operational environment will facilitate: Configuration Management (CM) and **remote loading**; Mission representative Command and Control (C2) **to achieve mutually supportive or cooperative** JCREW operations; Dissemination and use of JCREW-controlled signal data; and **Interoperability and compatibility with friendly force systems that use the same or nearly the same portions of the electromagnetic spectrum.**

DISCUSSION:

BACKGROUND:

The Counter Radio-Controlled Improvised Explosive Device (IED) Electronic Warfare (CREW) initiative has met urgent and compelling operational requirements to counter the threat posed by IEDs in order to reduce combat fatalities during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). This has resulted in a number of urgent procurements over the past several years such as the Quick Reaction Dismounted CREW systems, Spiral 2.1 Mounted CREW systems and SYMPHONY Coalition CREW systems in FY 06; Warlock Block II/III LX Upgrade; Jukebox; TCM AN/PLT-4 and TCM AN/PLT-5; Army Warlock Duke; USMC CREW Chameleon and Hunter and the recently issued CREW Spiral 3.1/3.2 contracts.

To support the development and acquisition of JCREW systems, the Navy was identified as the Single Manager for Ground CREW Technology on 7 October 2005. Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN (RDA)) subsequently requested Program Executive Office Littoral Mine Warfare (PEO LMW) establish a CREW program office (PMS-408) on 20 January 2006.

Previous procurements have focused on the rapid procurement of Commercial-Off-The-Shelf (COTS) products to address a rapidly evolving threat. The enemy is versatile and the tactics and

techniques are constantly evolving. JCREW SoS will provide commanders of the Joint Forces, with a capability to counter Radio-Controlled Improvised Explosive Devices (RCIED). In order to meet the current and future threats, Joint CREW (JCREW) will be technologically superior to earlier systems (greater spectrum coverage, more power, networking capability, etc.).

PROBLEM/OPPORTUNITY - ***What problem was being solved, or what opportunity was being missed?***

Previous procurements have focused on the rapid procurement of Commercial-Off-The-Shelf (COTS) products that were not built for interoperability and open architecture but could support a rapid deployment. The products met the requirements as defined in the Joint Urgent Operational Needs in which they where fielded; however, these systems, through not no fault of their own, resulted in some disruption in communication and protection under certain conditions. Other key concerns included the long term supportability of these systems which needed a close support structure to update the systems with the latest Loadset (a recipe of electronic attacks the CREW systems need to conduct their missions). This close-in support is not practical for world-wide deployment of CREW systems and is a supportability cost driver. JCREW is designed to be "Net-ready" (Threshold) and "Net-centric" (Objective). The value of a "Net-centric" system is that a Loadset can be distributed via radio waves over a secure network thus eliminating the close-in support dedicated to this function. In addition, other housekeeping actions could be executed over the air such as transfer of logs and up-load of new firmware. JCREW was designed to eliminate these challenges. Because the threat is tied to advances in the communication devices available to the adversary, the JCREW program Acquisition Strategy is to design for open architecture that will allow for the JCREW System of Systems to be incrementally updated to keep up with the threat and advances in technology. Key to this plan is to use commercial standards for circuit card assemblies, back planes, and software architecture that was "plug-and-play" from the start. Other considerations were to improve the human factors between systems (Mounted, Dismounted, and Fixed CREW Systems) to lower the training burden to the service member. In concert with this above approaches, the JCREW system acquisition timeline from MS B to MS C was established at an aggressive 24 months. As of the date of this nomination, the program is still on track to achieve MS C during 4th Quarter of FY11. In order to accomplish the strategy, the Assistant Program Manager implemented business rules to facilitate and track the work as completed by the contractors and government teams.

DESCRIPTION – ***(Describe what was done.)***

Essentially there are three areas where standardization impacted the program. The program's emphasis on establishing standardization among systems on the battlefield provides significant improvements to CREW system interoperability on the battlefield. Future system upgrades are facilitated by the use of commercial standards and interfaces and an open design architecture. Also, the program team recognized early the need to establish standard program management process control to keep this fast paced program moving forward on schedule and within budget.

As described in the background, the battlefield is congested with a diverse collection of electronics to include Radio-Controlled Improvised Explosive Device (IED) Electronic Warfare systems that compete with communications like Blue Force Tracking and other competing signals in the spectrum including environmental electro-magnetic emissions. Today's battlefield is a complex interoperability environment to include intentional, unintentional and naturally occurring electromagnetic emissions. Per the performance specification, the JCREW system is designed to be interoperable and compatible with United States Armed Forces and friendly forces that use the same nearby electromagnetic spectrum. Interoperability is achieved on the receipt and transmission of signals by the system, on the software blocking and interfaces, between the system variants for human factors (i.e. same look and feel between, mounted {vehicle or Riverine}, dismounted {man-pack} and fixed {i.e. security entry points and other fixed or semi-fixed installations}) and Electronic Warfare Coordination Center (EWCC) JCREW Control

Module (EJCM) between JCREW Devices to update as necessary Threat, Suppression Techniques, and Mission Tasking Data, software and firmware on JCREW Devices and export device status, event reports, and logistic reports.

In addition to the emphasis placed upon interoperability on the battlefield, the JCREW performance specification developers went to great effort to include standards to improve the ease of future upgrades to hardware, software, and firmware. Information exchanges with other co-resident systems on digitized platforms were designed to be via a set of function-specific byte oriented messages comprising the Common Link Protocol and standard Joint Variable Format Messages (VMF) and described in the Force XXI Battle Command Brigade-and-Below (FBCB2) system Interface Control Document and its future replacements. The system was designed with a standard GPS Small Serial Interface (SSI); required to meet MIL-STD 461 (Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment and a Key Standard for Vehicle-Based Computing); Standard 4-hole vehicular mounts for antennas; standard issue military batteries; human factor standards; use of common industry standards for all design elements, interfaces ("plug and play"), and connections per the performance specification were required to be non-proprietary, open, and published sufficiently for the subsequent open and non-competitive acquisition of those element from any source. All Circuit Card Assemblies and back planes were designed to VITA 48 (VPX-REDI) standards utilizing 1.0 inch pitch spacing to support VITA-48.2/48.3 CCA layout and VITA 42 XMC connectors. Other standard interfaces to processor FPGAs included Ethernet, RS232, RS422, SRIO and USB interfaces. The same keypad was selected for similar feel between variants. Also, all three variants use a common architecture with nearly identical FPGA designs.

All program managers know that requirements creep, scope creep, and change orders all can lead to crippling program execution issues. At program initiation, Milestone B, the Government and support contractors were directed by the APM to standardize their long range planning and reports. This standardizing allowed the PM to manage a large human enterprise effectively. Each provider is required to draft a basis of estimate the year prior that links discrete work packages to the program integrated master schedule. There are three levels of reviews, unfunded efforts are assigned risks and required to describe risks to inform the PM of the impact and consequence of unfunded or underfunded tasks. The PM is briefed on all work packages and risks prior to the execution year. All information is documented in a central planning tool. The PM is briefed on the execution of all work packages monthly and reports are generated monthly describing the work accomplished.

In summary, the team brought a wealth of experience into the requirements process early, supporting the authors of the JCREW 3.3 Capability Development Document (CDD); the CDD requirements were translated into a performance specification in which the authors ensured interoperability and standardization were articulated to industry, a series of industry days were used to answer questions and further clarify the performance specification; the team implemented standard business practices to ensure a highly escalated schedule was executed.

NOMINEE INVOLVEMENT – ***(Describe each nominee's involvement in the development and implementation of the solution. Be as specific as possible about what role the nominee played.)***

Mike Craft, Assistant Program Manager (APM): The APM was one of the Subject Matter Experts advising the requirements community to help take their needs and draft a Capability Development Document where requirements could be derived into a performance specification. He led the communications with industry to determine the best ideas to achieve an Open System to quickly respond to the warfighter requirements. He was a major contributor to the performance specification; assembled the team to execute the project; and an advocate to standardized business processes. Mr. Craft drafted several integrated project teams to help manage the work across multiple functional areas which were key to managing a geographically diverse team of highly specialized experts. He documented all of his process in JCREW Integrated Program Management Plan (IPMP). The IPMP describes the overall

program structure; deliverables; related management plans and procedures; and the methods used to plan, monitor, control, and improve the program's development efforts.

Keith Plumadore, Technical Design Agent (TDA): Mr. Plumadore was another major contributor to the performance specification; a Subject Matter Expert (SME) and design agent for several of the legacy CREW systems. He was instrumental in the preparation for the technology readiness reviews that allowed the team to enter into MS B; and the lead for technical clarifications between the Government and Industry. Mr. Plumadore lead a team of DoD experts in the analysis of alternatives that was instrumental in defining the reasonableness of potential capabilities and technologies that was used to draft the Capability Development Document (CPD) Key Performance Parameters and other requirements. Assigned the TDA, his team drafted the Technology Assessment that established the technology Readiness Levels for key technologies to support the Milestone B decision.

Bruce Strackbein, Fixed Site Lead: Mr. Strackbein was the lead within PMS-408 for the review of the performance specification; a SME and designed agent for several of the legacy CREW systems. He was the lead for the cost team during source selection. Mr. Strackbein was a major contributor to JCREW Analysis of Alternatives and CDD.

Adam Webb, Mounted Project Lead: Mr. Webb provided valuable subject matter expertise for platform interface control for the mounted aspects of the system. His joined the team after the initial performance specification was drafted but has been hugely instrumental leading his team through revisions and technical clarifications that have reduced the overall risk to platform integration.

Jim Ryan, Lead Analyst and Dis-Mounted Project Lead: Mr. Ryan joined the team in 2008 and his primary contribution to the project involved the institutionalizing standard project management tools for all providers that help the PM and APM in the execution of the project. Specifically, Mr. Ryan implemented standard reporting for project tasks to fiscal execution. These reports continue to provide the APM with a monthly snap-shot of the work accomplished across for ten Government providers. Mr. Ryan played a role in the performance specification final reviews providing clarifications that lead developers to clearly understand the warfighter's preference for a single pack solution is more desirable than a multi-pack. This has been clearly a point the warfighter has emphasized through the development phase and also supports a wider user community that could not use a multi-pack approach. Other accomplishments included providing a study on a wide array of potential integrated digital environments for the project to employ for vendor deliverables and program documentation. His pair-wise analysis provided the best value for the government that was eventually deployed.

OUTCOME: ***(Describe what happened as a result of what was done with regard to the following)***

- **PAYOFF:** ***(Present cost savings or cost avoidances, improvement in performance, safety, reliability, quality, sustainability, interoperability, or other operational improvement, which can be attributed to standardization. Try to actually quantify savings or improvements to the extent possible. Also address here the breadth of applicability of the accomplishment. Is it used across systems, across the Services, with our allies? Costs of developing and implementing the solution should be acknowledged and quantified to the extent possible).***

1. Reducing the future design phases is one of the key potential benefits resulting from the JCREW 3.3 open and modular design. Using the current development costs, it can be estimated the project will reduce future development schedule by six months to a year and result in potential savings to the tax payer of $20-50 million,

2. By improving system interoperability between and among JCREW variants, and between legacy CREW systems, the JCREW system will reduce casualties on the battlefield.

3. The most significant impact of the design choices is likely net-centricity and embedded training capabilities that will result in smaller logistic footprint and in-service engineering cost reductions expected to reduce annual support costs by several million for each service or ally in cost avoidance for forward service facilities and training material deployment that can be significantly reduced.

- **CURRENT STATUS:**

  In September 2010 the program successfully completed its Critical Design Review on time and within established costs thresholds. The developer delivered a prototype of each variant and demonstrated the design standard interfaces and common open architecture and modular hardware that were required for the performance specification.

PROBLEMS IN EFFECTING SOLUTION: ***(Describe any particular barriers that were overcome in effecting the solution, whether they were monetary, political, technical, cultural, or other).***

The Team often talks about traveling at CREW Speed. This defines the speed the system must perform to beat the RCIED threat and the speed of the program schedule. When traveling at this pace it is often easy to cut corners to save time. This was an unacceptable approach and through the leadership of the Program Manager and the Assistant Program Manager, the team was inspired to help the developer to achieve the open design and modular approach utilizing established industry standards. The team spent the necessary time with the developer to insure they understood the Government's desire and ensure the system will achieve its interoperability goals and will be easy to upgrade in the future to increase capabilities and keep ahead of the threat. Instrumental to this effect was the challenge to improve the business processes and reporting processes of the Government providers that ensured leadership understood how the larger geographically dispersed team was executing. These business processes were not popular upon implementation, but as the team executed they commented on the benefits to managing the effort due to the common processes and reporting requirements.

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1. **Service/Agency: USN/SPAWAR Systems Center Pacific**

2. **Point of Contact Information:**

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Narrative Description Page

Service or Agency: **USN/SPAWAR Systems Center Pacific**

Title of Project: **Interoperable Systems Management and Requirements Transformation (iSMART)**

DESCRIPTION: **Interoperable Systems Management and Requirements Transformation (iSMART) practices provide:**

- **Disciplined systems engineering approach,**
- **Capture the full extent of information flow between systems, and**
- **Manages information exchange requirements throughout the life cycle of a system.**

The employment of the iSMART process in Systems Development provides:

- **Improved awareness and a greater level of detail of platform performance during the capability definition process.**
- **Mitigated ambiguities and a greater understanding between Service program managers and system developers.**
- **Joint Mission Area assessments conducted at an improved level of detail required to deliver combat capability.**
- **Improved Service-validated implementation detail used to support the objective Joint Capabilities and Limitations (JC&L).**

DISCUSSION:

BACKGROUND – In the critical arena of National Defense- unambiguous data exchange is the key component of Interoperability. iSMART provides the focus needed for the efficient use of resources, including money, time, manpower, and facilities. The end state of iSMART is the rapid, unambiguous transfer of tactical digital information to and between sensors, shooters, and command and control (C2) nodes to maximize warfighting capabilities.

PROBLEM/OPPORTUNITY – Historically Systems Developers struggled with the conversion of mandated standards and specifications when translating into correct implementation forms. iSMART provides the opportunity for program managers to greatly increase the efficiency of the development process:

- **Assists program developers in correctly implementing data links on a platform.**
- **Provides the end-user with the platform specific information to utilize the platform to the maximum advantage.**
- **Fills the gap between the high-level specification of platform capabilities and the low-level documentation of computer program performance.**
- **Translates high level requirements into bit-level implementation that meets the requirements to achieve interoperability.**

- **Early application ensures accurate specification of requirements.**

Platforms that implement iSMART early in the acquisition cycle realize the benefits of planned interoperability:

- **Early problem correction,**
- **Timely cost decisions, and**
- **Full documentation of a platform's information exchange capabilities.**

DESCRIPTION – iSMART is a nationally recognized Engineering Best Practice which provides:

- **Disciplined systems engineering approach**
- **Captures the full extent of information flow between systems**
- **Manages information exchange requirements throughout a system's life cycle.**
- **Provides a common system engineering method initiated at the beginning of system development that significantly increases the probability of fielding systems that maximize contribution to Joint capabilities.**

NOMINEE INVOLVEMENT – For the last seven years the team has been the U.S. Navy's Space and Naval Warfare Systems Center (SPAWARSYSCEN) Pacific premier experts in developing and advancing the employment of the interoperable Systems Management and Requirements Transformation (iSMART) program. They have been and remain THE 'go-to' group for U.S. Navy iSMART implementation across 18 USN and Allied systems developers. Their efforts have been and continue to be THE driving force in making the processes for developing Navy Tactical systems as efficient, effective, and capable as our nation's Warfighters require.

<u>OUTCOME:</u>

<u>OPERATIONAL RELEVANCE:</u>

- **Improved awareness and a greater level of detail of platform performance during the capability definition process.**
- **Mitigated ambiguities and a greater understanding between Service program managers and system developers.**
- **Joint Mission Area assessments conducted at an improved level of detail required to deliver combat capability.**
- **Improved Service-validated implementation detail used to support the objective Joint Capabilities and Limitations (JC&L).**

<u>PAYOFF:</u> During this period there have been numerous Major Accomplishments, Products, and Deliverables:

- **Joint US Military-Standard-6016 revised in a transactional format**
- **USN and Joint iSMART Handbooks promulgated**
- **DoD-wide iSMART Military Handbook is in development by the team.**
- **Assistant Secretary of the Navy for Research, Development and Acquisition Chief Engineer (ASN RDA CHENG) formally endorsed the use of iSMART for Systems**

Acquisition and employment of the USN iSMART Handbook developed by the team.

- **New acquisition programs employing the iSMART process:**
- **F-35 (Joint Strike Fighter), P-8A (Multi- Mission Aircraft), and Broad Area Maritime Surveillance Unmanned Aerial System (BAMS UAS), DDG 1000 , Aegis/BMD, CNI Flt 0/0+, GCCS-M MTC, EA-6B, F/A-18 C/D/E/F, EA-18G**
    - **P-8A preliminary analysis yielded cost savings of $13M through the clarification of TDL requirements**

A notable point of success from this team's efforts resulted in the MH-60R/S Helicopter's successful Link 16 development and fielding.

- **MH-60R/S Link 16 development/certification test results with iSMART;**
- **Navy Link 16 interoperability certification with six Trouble Reports (TRs)**
- **Joint interoperability certification with eighteen TRs The norm for a new program of this complexity is 35-40 TRs from USN and Joint certification tests.**

Recognized by National Defense Industrial Association (NDIA) as one of the "Top DOD Programs for 2007"

CURRENT STATUS: Ongoing and expanding. The current eSMART development effort for automating iSMART processes and the team led Joint Military Handbook creation will drive the process significantly into the Network Ready realm for even greater efficiencies.

PROBLEMS IN EFFECTING SOLUTION: All this has been accomplished during an austere budget climate, shifting organizational alignments, and the historic reluctance to change of large program entities and offices.

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1. **Service/Agency: Department of Navy**

2. **Point of Contact Information:**

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- **DESCRIPTION** (Summary of accomplishment and payoff)

  The Ship-to-Shore Connector (SSC) program has achieved significant improvements in reliability and readiness as the Navy's new assault landing craft over the Landing Craft, Air Cushion (LCAC) program which is the current assault landing craft. These reliability and readiness improvements were achieved by focusing the SSC design on commonality and standardization while also addressing the LCAC top 25 maintenance drivers. To ensure reliability improvements and equipment commonality were at the forefront of the SSC's design, for the first time in over ten years the Navy performed an "in-house" design. This "in-house" design effort was responsible for both Preliminary and Contract Design phases of the program. The Navy stressed commonality and interchangeability of equipment. This effort resulted in improvements in reliability and standardization in all areas of the craft. The Navy projects improvement in SSC over LCAC in operational availability from .50 (LCAC) to .90 (SSC) and material reliability from .53 (LCAC) to .97 (SSC). In addition to this significant increase in reliability and readiness the Navy projects a cost avoidance of over $1.6B during the 30 year service life of the 72 operational craft.

DISCUSSION:

- **BACKGROUND**

  The Navy's assault landing craft (LCAC and SSC) are very unique air cushion vehicle craft as they are the only high density air cushion vehicles in the world. Their mission is to transport joint landing forces and equipment from amphibious ships at a high-speed and offload over-the-beach in both peace and war time environments. The size of both the LCAC and SSC are constrained as they must fit in the well deck of legacy amphibious ships. The lift and carry capacity of the SSC must be sufficient to support the heaviest landing force equipment, M1A1 Main Battle Tank, and transport it in sea state and temperature ranges spanning the world. As a result engine power and overall craft weight are critical components enabling the SSC to meet its operational mission.

  As the threat evolves and changes around the world the equipment used by our solders must change and adapt to the threat. This current change in equipment has required the landing force vehicles and equipment to get significantly heavier with the adaption of armor plating and design changes to counter Improvised Explosive Devises (IEDs). As a result of this increase in weight in order to carry a M1A1 Main Battle Tank the LCAC is in an overload condition which requires a waiver on stability requirements, and the Operational Commander must trade the amount of fuel carried on the LCAC for payload weight.

- **PROBLEM/OPPORTUNITY**

LCACs require a significant amount of the operating force's limited funds to keep the craft operational due to high maintenance, obsolete equipment and systems, and aging technology. Additionally, LCACs have little standardization in terms of systems layout, outfitting, and system components. For example, LCACs have two different air conditioner unit sizes, eight gearboxes (including four high-maintenance right-angle sets), non-standardized window sizes, a protection system with multiple unique piece parts, gas turbine engines unique to that application, and several aging and unreliable components (like sensors, engine Full Authority Digital Electronic Controllers (FADECs), and remote control circuit breakers). The electrical generation consists of Auxiliary Power Units that are designed for intermittent use but are used as craft generators.

As a result of these high maintenance, obsolete equipment and systems and a lack of standardization in systems, the LCAC readiness availability continue to degrade and is in jeopardy of not meeting Operational Commanders requirements.

- **DESCRIPTION**

Based on over 20 years of operational experience from the LCACs, the Navy has identified problems with the LCAC design that should be designed out in the replacement craft (SSC). The SSC will improve reliability through a design that focuses on standardization.

The SSC program set design goals for each engineering area with respect to standardization and designing out the LCAC top 25 maintenance drivers. Some examples where the design changed to improve readiness/reliability of the craft are:

Electrical Distribution System: The LCACs utilize a 400 Hz electrical distribution system which utilizes non-COTS components and has proven to be a significant cost driver. The SSC design replaces the 400Hz electrical distribution system with a 60Hz electrical distribution system which is more standard and used in most shipbuilding programs. This will allow for more extensive use of COTS components resulting in substantial TOC saving over 400 Hz non-COTS components.

Power Generation: The LCACs utilize two Auxiliary Power Units (APUs) which are gas turbine-driven generators for power generation. These APUs are designed for intermittent use and not intended for continuous operation which is how they are used on the LCAC. Consequently in the LCAC application these APUs are not reliable or fuel efficient. The SSC design utilizes a common generator for two applications. First, the generator is utilized as a main reduction gearbox driven Craft Service Generators (CSGs) and second, they also serve as the power

generation side of the APUs. This allows the generators to be used as intended in the CSGs for continuous operation and use of the APUs for intermittent operation; increasing reliability and fuel efficiency. The Navy predicts an annual fuel savings in excess of 270,000 gallons for a fleet of 72 SSC craft which equates to over an 8 M gallon saving for the life of the SSC fleet.

Prime Mover: Current LCAC engines are not able to provide the power necessary to create the lift for the LCAC to accommodate the heavier weight of the landing force equipment, and as a result various modifications to the engines have been tired to increase the power. These attempts have not met with success and have increased the LCAC maintenance issues and reduced reliability. The SSC design prime mover options are both from a family of engines developed for aircraft in the current U.S. Navy inventory and provide the power required to accommodate the heavier weight of the landing force equipment. These engines require a minimal amount of modifications to be adapted for the environment of the SSC. The selection of engines that are already in the Navy inventory significantly reduces the logistical requirements. Based on over 20 years of operational experience from the LCACs, the Navy has identified problems with the LCAC design that should be designed out of the replacement craft. The SSC will improve reliability through a design that focuses on standardization.

Drive Train: The LCAC has six gearboxes which have become maintenance and reliability issues. The SSC design consists of one in-line gearbox per side and identical drive trains, port and starboard. The SSC utilizes a common gearbox that can be configured to be installed port or starboard.

Hydraulic Systems: The distributed hydraulic system on LCAC which had become very maintenance intensive and negatively impacted craft reliability was replaced in the SSC design with either low maintenance electrical actuators or localized hydraulic units. In an effort for equipment/system commonality the port and starboard propulsors are interchangeable. Additionally, the component parts within each propulsor are interchangeable between port and starboard propulsors.

Lift Fans: The LCAC utilizes four lift fans where in the SSC design, an improved lift fan design was incorporated allowing the reduction in number from four to two. These fans are configured to be interchangeable so that the same unit can be used on either the port or starboard side of the craft.

Other improvements in standardization and reliability in the SSC design include:

- The lift fan shafting and propulsion shafting are interchangeable port and starboard, and configured to be broken into identical size segments
- One size, interchangeable Heating, Ventilation and Air Conditioning units throughout the craft
- Standardized window sizes (reducing the number of unique parts from seven to three)

- Standardized protective panel sizes
- The use of a Pilot / Co-Pilot configuration for the craft (identical controls, displays, flight crew seats)
- Identical Command Station non-flight crew seats and Observation Station seating
- Interchangeable skirt segments

- **NOMINEE INVOLVEMENT**

Tom Rivers was the Principal Acquisition Program Manager (PAPM) through 2009 and currently is the Deputy Program Manager (DPM) for PMS377. As PAPM, Mr. Rivers identified the LCAC Top 25 Maintenance Issues as a priority for the SSC design to address. Mr. Rivers created a design culture that emphasized engineering decisions that provide for the required capabilities with an effort to improve reliability through design with a focus on standardization which results with the lowest Total Ownership Cost. As DPM, he further emphasized this design culture.

Dawn Doebel succeeded Mr. Rivers as the PAPM in 2009. Ms. Doebel continued the efforts to optimize and incorporate standardization in the design and is responsible for developing the acquisition strategy where one design for all craft will be utilized regardless of the number of different craftbuilders. Historically, different craftbuilders have built crafts that look the same from a performance standpoint but are very different in equipment configuration creating a parts support nightmare.

Walter Mebane is the Ship Design Manager (SDM). Mr Mebane as the senior technical engineer was essential in requirements definition process and its translation to system capability and performance. He was responsible to ensure that system and equipment performance and cost tradeoffs were fully and accurately articulated. He worked closely with the Program Office to ensure reliability and standardization goals are achieved.

Craig Carlson started in the SSC program as the Concept Design Manager (CDM) and directed the engineering and technical tradeoffs of the SSC Analysis of Alternatives (AoA). Upon completion of the AoA and selection of a craft option Mr. Carlson became the Deputy SDM (DSDM).

Chris Dowd served as the Design Integration Manager (DIM) throughout Preliminary and Contract Design. He was responsible for ensuring that all engineering groups understood and realized their reliability and standardization goals. Additionally, Mr. Dowd was responsible for developing a converged technical product based on the principal design characteristics for the lowest TOC.

OUTCOME

- **PAYOFF:**

  The SSC program will replace the current fleet of 72 LCAC with 72 craft whose design focused on commonality and standardization of equipment and systems and addressing the top 25 maintenance drives on the LCAC. Total program procurement cost is projected to be over $4B. The Navy's project operations and support life cycle cost avoidance for the SSC program equates to a 5% savings over the current LCAC program. Additionally, the SSC program will have significantly improved reliability and operational readiness. The material reliability of the SSC is projected to be 0.97. The operational availability is projected to be 0.90. By comparison, the LCAC values are 0.53 and 0.50, respectively.

- **CURRENT STATUS:**

  The SSC Design which is contained in the Technical Data Package is complete and has been certified by the Technical Warrant Holders in NAVSEA and the Chief Engineer of the Navy NAVSEA 05. The TDP is planned for release to industry in the SSC Request For Proposal later this year.

- **PROBLEMS IN EFFECTING SOLUTION:**

  The SSC is not a capital warship, it is a 92 foot long craft that has a crew of five, lead by a Chief Petty Officer; as such, its resources are more austere than other higher profile programs. Additionally, since the SSC will transport Marines and their equipment from amphibious ships in the sea base to shore, it must fit inside the size-constrained well decks of amphibious ships.

2010 Defense Standardization Program Award

Nomination Cover Page

1. **Service/Agency: Naval Air Systems Command (NAVAIR) PMA-274**

2. **Point of Contact Information:**

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3. **Individual or Team Member Information (not more than five):**

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2010 Defense Standardization Program Award Nomination

Service or Agency: Naval Air Systems Command (NAVAIR) PMA-274

Title of Project: Presidential Helicopter Program (PMA-274) VH-60N and VH-3D Upgrades

DESCRIPTION: The PMA-274 In-Service Integrated Product Team (IPT) is hereby nominated for its work to upgrade the VH-60N and VH-3D helicopters that provide safe and timely transportation for the President and Vice President of the United States, visiting heads of state and other parties as authorized by the director of White House Military Office (WHMO). The In-Service IPT utilized standardization initiatives in the arena of program management, systems engineering, integrated logistics, repair practices and risk assessments to implement a Cockpit Upgrade Program (CUP) and Top Deck repairs for the VH-60N and weight reduction/weight management and engine drive system vibration reduction upgrades for the VH-3D. These upgrades improved helicopter performance, enhanced flight safety, reduced pilot workload, and resulted in estimated cost avoidance of $50M.

DISCUSSION:

- **BACKGROUND**
  - VH-60N: The VH-60N cockpit was operating with essentially the same equipment as when it was delivered in the 1980s. Newer capabilities such as Global Positioning System (GPS), Traffic Alert and Collision Avoidance System (TCAS), and Identification, Friend, or Foe (IFF) Mode 5 were added to the avionics on a piece-by-piece basis adding weight and stressing the performance and load bearing capabilities of the legacy mission aircraft. The cracks in the VH-60N Top Deck, as a normal result of cumulative fatigue and loads imposed throughout the structure, required PMA-274 to conduct an investigation that recommended replacement of critical airframe components including Top Deck main beams in order to reduce the probability of cracks and loss of operational availability (Ao). Top Deck main beam cracking is not a safety of flight issue due to secondary load path (failsafe), but may render the aircraft non-mission capable. Due to the small fleet size and criticality of mission this is unacceptable.
  - VH-3D: The SH-3 propulsion system has historically demonstrated a resonance mode near the system normal operating frequency. This resonance mode causes the vibration levels to exceed the engine manufacturer limits as well as produce an audible howl. Both soft mount and hard mount configurations were tested to de-tune the resonance response frequency away from the normal operating frequency. The maintenance burden on soft-mounts was too high and hard mounts required the use of de-tuning weights. In the VH-3D, there were instances of howling experienced when the aircraft went to the hard mounts; however, they were not in the normal operating range. Adding to the problem, the VH-3D helicopter gross weight had increased significantly over the years. To ensure future mission readiness, the teams have instituted standardized weight reduction and weight management programs. Through this emphasis on standardization rigor the weight management program determine root cause, affected a fix and instituted the solution using a standardized NAVAIR Systems Engineering Processes.

- **PROBLEM/OPPORTUNITY**
  - CUP: For the VH-60N, the core mission computing system was not capable of supporting piece-by-piece modifications nor could it meet the standard Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) requirements. Many of the core components were no longer manufactured or maintained and component reliability/availability was affecting mission readiness. New technologies were available and being used by other Department of

Defense (DoD) platforms. These technologies were lighter, more effective, more reliable and provided the aircrew with better situational awareness in the cockpit while reducing workload.

- Top Deck: In early 2010, the PMA-274 Air Vehicle IPT conducted a vigorous engineering investigation/analysis and made recommendations to senior leadership based on a cost/schedule/performance risk approach. Using standardized engineering process the final analysis showed that the likelihood of crack propagation in the Top Deck area was significantly less than originally anticipated from the 2002 study. The decision was based upon the discovery of two items. First, the 2002 Service Life Extension Program (SLEP) report utilized a database that included data through 1997 and the database did not include many of the primary structural items such as transmission beams. Additionally, there was a more recent database containing crack data that included main beam cracks covering the 2000 – 2010 timeframe. Second, the impact to squadron operations was over-emphasized due to two cracks discovered on the same structural member on different aircraft in relatively short time spans.
- Weight Management: For the VH-3D, the increased aircraft weight required increased power to operate the aircraft, specifically in confined areas. The problem was how to reduce the weight of the aircraft to increase the power margin while not impacting mission readiness.
- Engine Drive System Vibration Reduction: Two VH-3D aircraft recently experienced howling near the operating range, and in a few instances, in the operating range. The standardized maintenance procedures call for removal and replacement of high value items; engines, high speed shafts and torque tubes. When these procedures were unsuccessful, the engineering team recommended the de-tuning weights from the SH-3.

- **DESCRIPTION**
  - CUP: The VH-60N CUP utilized state-of-the-art, mature technologies to avoid obsolescence in delivered systems. This new standardization program provided the new cockpit system increased growth potential, improved system functionality, reduced costs by utilizing commercial off the shelf (COTS) hardware. Additionally, by utilizing the state-of-the-art components available for DoD it reduced the need to upgrade components during system integration and development, or soon after deployment. Incorporating a standardized true open systems architecture (currently being used on Fleet SH-60's) and modular construction allowed the introduction of new technology with minimal impact for software fixes and the preplanned product improvement upgrade (P3I). It also allowed the aircraft to maintain VH legacy unique interfaces and components. The main user interface was designed to be standard across both the VH-3D and VH-60N (i.e., Control Digital Unit based) to maximize pilot familiarity between platforms. Furthermore having standard interfaces will allow standardized training across the two helicopter platforms, thus saving training funds and flight time. The Avionics IPT ensured compatibility and interoperability paths for horizontal technology insertions for the VH-3D and VH-60N to standardize requirements, and reduce the logistics footprint.
  - Top Deck: The Air Vehicle IPT conducted a thorough investigation of cracks on the VH-60N Top Deck primary load-bearing structure. After conducting a standardized risk analysis (Hazard Risk Analysis (HRA)), it was determined that an upgrade with squadron tooling and material parts necessary to perform repairs vice replacement of the Top Deck was the preferred solution resulting in a cost avoidance of $50M.
  - Weight Management: The Air Vehicle IPT utilized their standardized Battle Rhythm that ensured the Program Office maintained ongoing communication with the sponsor, customer and prime contractor to address potential solutions. During these discussions it was determined that by summer of 2010, an increase in performance capability was required. To accomplish this tasking on short notice, the Air Vehicle IPT gathered experienced industry and government personnel to discuss/evaluate proposed solutions. Besides aircraft interior weight reduction options, the team also discussed engine options that could rapidly be executed. The resultant

weight management reductions included installing a more efficient engine inlet, redesigned interior panel and compartments, removal of communications equipment and redesigned main landing gear. The Air Vehicle and Avionics IPTs, in conjunction with the Fleet, created a standardized weight reduction and weight management program for the VH-3D helicopter replicating successful efforts in other Helicopter programs. Their dedicated efforts removed 407 pounds from the aircraft with future plans to remove an additional 114 pounds.

- Engine Drive System Vibration Reduction: The Air Vehicle IPT utilized the NAVAIR standard Hazard Risk Assessment (HRA) to determine the operationally suitable path forward to reduce maintenance hours, number of parts to be replaced and improved aircraft operational availability by switching from soft gimbal mounts to hard gimbal mounts. In the past, the soft mounts would wear, causing unknown vibration responses as well as unsightly oil leaks. The failure of soft mounts also led to increased input seal failures. In order to sustain aircraft availability, soft mounts were changed every 150 hours as preventative maintenance. The procedure to change soft mounts required engine removal and reinstall and was arduous due to a poor maintainability design. Furthermore, soft mounts were masking and attenuating a vibration resonance mode. While untested and unproven, the absorbing of the unstable vibration responses was most likely a contributing factor to their wear. In a period of less than a month, a standardized solution was recommended, prototyped, tested and evaluated for the complete fleet and has applications for commercial use as well. Completion of paperwork to install the fix and allow the squadron the ability to implement the change was six weeks.

- <u>NOMINEE INVOLVEMENT</u>
  - Mr. Mark Lysaght, as the Air Vehicle IPT lead, managed the overall effort of the project ensuring that the proper personnel and funding were in place and the engineering efforts were conducted in a rapid manner. His precision execution of the weight reduction initiatives led to improved power margins for the aircraft and initiated the review process of the past Top Deck analysis to verify the previous solution was still valid. Further analysis revealed that Top Deck replacements were not required and that standardized Top Deck repairs would provide a potentially higher availability rate for HMX-1 at a much lower risk level. His idea led to a cost avoidance of $50M and allowed the Program Office to fund two high priority unfunded aircraft issues.
  - LCDR Judith Muller (USN), as the Avionics IPT Lead assisted with negotiations and management of the contracts for CUP kit buys and installs, as well as P3I software upgrades while also managing the weight reduction effort of all avionics initiatives.
  - Major Tom Devine (USMC), as the Assistant Program Manager Systems Engineering, coordinated with HMX-1 personnel to execute prototype aircraft installations and to provide pilot subject matter expertise on all weight reduction initiatives. He coordinated with NAVAIR personnel to ensure that the required technical personnel were available at the squadron to support testing and aircraft installation. He also spent four days on-site as the Program Office point of contact coordinating between technical and logistics subject matter experts.
  - Ms. Debbie Cleavenger, as the Assistant Program Manager Systems Engineering, Lead, reviewed analysis of H-60 maintenance database ensuring her technical team arrived at the proper conclusion. Her technical expertise led to a low cost / low risk solution ensuring a high future aircraft availability rate for HMX-1. She prepared and conducted numerous technical briefs to senior engineering personnel that led to a consensus approval of the team's standardized Top Deck repair vice Top Deck replacement approach. She ensured technical execution of standardized weight reduction initiatives were conducted with a low risk approach while coordinating with numerous subject matter experts to ensure that all possible solutions were researched.
  - Mr. Sylvester Campbell, as the Assistant Program Manager Logistics, was instrumental in locating and providing historical database information that led to the final analysis of the Top

Deck issue. He ensured proper tooling and spare Top Deck beams were pre-positioned at HMX-1 allowing a rapid response to standardized Top Deck repairs. He was instrumental in ensuring that standardized maintenance procedures were incorporated into the maintenance publications. He quickly executed weight reduction efforts on the remainder of the VH-3D aircraft after these items were approved by Deputy Commandant for Aviation of the United States Marine Corps and the White House Military Office. These efforts were conducted at no cost to the program office and resulted in a 220 hour reduction of maintenance re-work hours or approximately $160K per year.

OUTCOME

- **PAYOFF**
  - On the VH-60N, the CUP avionics suite core components were procured as part of a development program that involved the U.S. Army, U.S. Coast Guard and U.S. Navy. The lessons learned from each effort were shared among the participants along with the associated costs of system development and parts procurement. By using a DoD wide standardized processes, VH-60N CUP was able to achieve Green on the Independent Logistics Assessment on the first attempt for Milestone B, Milestone C, Full Rate Production, and Initial Operational Capability Support Requirement. Additionally, successful implementation of the VH-60N CUP, has helped mitigate obsolescence issues on the VH-3D. Spare components that were common between both legacy aircraft, but were replaced in the VH-60N CUP, are now being used as spares on the VH-3D. This allowed the team to phase the VH-60N CUP and the planned Cockpit Upgrade of VH-3D (FY12). If these two efforts had been conducted simultaneously, manpower requirements would have been higher and the team would not have been able to leverage lessons learned on the VH-3D program.
  - The outcome of the Top Deck crack study was briefed to Deputy Commandant for Aviation of the United States Marine Corps; Program Executive Officer, Air ASW, Assault and Special Missions Programs; and Program Manager PMA-274. All concurred with the recommended approach of not conducting the Top Deck replacement and instead posturing HMX-1 with tooling, manpower and material to repair structural member cracks and to cold-work the Top Deck main beams during the aircraft's Special Progressive Aircraft Rework (SPAR). Replacement of the VH-60N Top Decks was projected to cost taxpayers $52M (Total Ownership Cost (TOC) in 2010 dollars). By not replacing Top Decks and instead posturing HMX-1 with the standardized tooling and material to repair Top Deck cracks, as well as cold working Top Decks during SPAR, this decision resulted in a total cost of $2M and avoidance of $50M.
  - On the VH-3D aircraft, the weight changes resulted in immediate success by increasing aircraft performance by 4%. Standardized weight reduction initiatives resulted in the removal of 407 pounds from the aircraft with plans to remove an additional 114 pounds. This weight reduction plan required minimal development funding and resulted in a 220 hour reduction of maintenance re-work hours or approximately $160K annually. Also, the installation of the torque weights permits the aircraft to be returned to service with the hard mounts installed. The hard mounts save 110 man-hours of preventative maintenance and approximately $110K in parts.

- **CURRENT STATUS:**
  - VH-60N CUP reached IOC on Feb 25, 2010 and currently has 900 productive flying hours. CUP installations are currently being installed on two airframes in conjunction with depot level SPAR. The team is finalizing the contract for CUP P3I software and is expected to award on schedule. The final CUP installation contract is expected to award in early FY11. Due to the replacement aircraft cancellation, the VH-60N will be required to provide a service life well into the 2025 time frame. During this period, various CNS/ATM components will become obsolete. The VH-60N

CUP program ensures future requirements and capabilities will be met through the use of a modern, standardized, open architecture. Due to the people involved on both the government and contractor teams, CUP is now a success story. To quote the Commanding Officer of HMX-1, "You guys have turned every line of operation into a gem. You brought us back from the edge. Thanks to your entire team."

- A standardized weight management program has also been instituted where the approach is that all weight additions must "buy" their way onto the aircraft and all stakeholders must approve these weight additions.
- On the VH-3D, the team awaits Configuration Control Board approval to issue direction to HMX-1 to install the torque weights, while continuing to posture HMX-1 with the required tooling and material to conduct Top Deck repairs and will have all components in place by May 2011.

- **PROBLEMS IN EFFECTING SOLUTION:**
  - Top Deck: The SLEP assessment was conducted in parallel with Top Deck tooling fabrication & kit design assumed Top Decks would be replaced. Initial recommendations were that SLEP would not be viable unless the Top Decks were replaced, and without Top Deck replacement, SLEP assessments would have to be conducted again. After discussing the details of the issues with lower level specialists, the initial recommendations were reversed and SLEP recommendations were valid with or without Top Deck replacements.
  - The team had difficulty with developing the final list of executable initiatives vice options that would require significant research and development efforts. This problem was resolved by ensuring that all stakeholders understood the short time line that was required to execute the approved solutions. With regard to switching from soft gimbal mounts to hard gimbal mounts, the team did not identify any issues. Due to the shortened timeframe that was required to implement a solution, technical personnel and squadron assets were made available as required.

2010 Defense Standardization Program Award

Nomination Cover Page

1. **Service/Agency:** Department of the Navy (NAVSUP/NAVSEA) , DLA (DLA Maritime Mechanicsburg)

2. **Point of Contact Information:**

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2010 Defense Standardization Program Award Nomination

Narrative Description Page

Service or Agency: US Navy/Defense Logistics Agency

Title of Project: Hull, Mechanical & Electrical (HM&E) Standardization

DESCRIPTION

NAVSEA, NAVSUP, & DLA are engaged in addressing Navy Hull, Mechanical & Electrical (HME) standardization and related procurement process challenges through the HME Standardization Governance Board. The 2 main pillars of the effort are: developing commodity contract vehicles based on industry best-practices; and developing a best value process/tool for government procurement entities in order to maximize use of already existing Navy equipments.

Navy and DLA entities partnered to award long-term commodity contracts to be used by industry and government that will drive standardization into the fleet. These commodity contracts will be a principal source for standard cost-wise HM&E material. NAVSEA (NSWCCD & NSLC) conducted an analysis of equipment currently installed on active Navy ships and targeted valves for the initial standardization effort as they represent the largest number of equipments (2,275,141) installed. DLA (DSCC Mechanicsburg) then awarded several valve contracts to promote standardization of valves on Navy ships in JUL 09. The award includes five long-term, indefinite delivery, indefinite quantity contracts and is valued at more than $26M over five years. This represents a big step in the ongoing effort to reduce costs by leveraging valve equipment commonality for all U.S. Navy ships.

The Naval Sea Logistics Center (NSLC) has developed an approach that determines "best value" HM&E equipments that are: manufacturer supported, currently in the DLA/Navy supply systems, and has ILS in place. To be used by government entities, the Best Value approach provides a "Cost Wise" decision-making ability for the selection of HM&E material. The approach combines various total ownership cost factors and identifies existing HME equipments with best/better value. This effort will aid government entities in their material and equipment selection process by allowing maintenance to install best value items thereby lowering life-cycle cost and increasing readiness.

DISCUSSION:

- **BACKGROUND**

Reduced budgets, constrained resources, increased costs of weapon systems support and expanded military deployments have, more than ever, generated the need to identify Total Ownership Cost (TOC) reduction savings opportunities. In recent years, Naval guidance has cited an increasing need for maintaining readiness, and reducing acquisition and sustainment costs throughout the life cycle. Material support represents one of the biggest potential areas of cost savings to the Department of the Navy (DON).

One of the largest opportunities related to this approach has been within the Hull, Mechanical, and Electrical (HM&E) equipment area. However, the high level of non-standardized HM&E equipment fleet installations represents one of the biggest challenges when

executing standardization strategies. The introduction of non-standard items into the Fleet negatively impacts readiness and drives higher Integrated Logistics Support (ILS) costs. In order to mitigate this negative impact, formal standardization approaches, complete with a plan of action, milestones and metrics need to be developed and executed if the Navy is to realize the benefits of lower TOC and higher reliability.

Historically, the Navy effects on average over 360,000 HM&E equipment installations per year. These installs represent a range of 37,000 pieces of unique HM&E gear. On average, there are approximately 2250 pieces of new HM&E items introduced annually. New equipment introduction occurs at all New Construction and Fleet maintenance and repair activities. The decision to procure and install non-standard items in Fleet applications is a result of competing objectives and priorities on the part of the stakeholder. These competing priorities have led to decisions that are often in the best interest of the individual stakeholder, rather than the best interest of DON standardization priorities and have caused impacts on Fleet readiness.

- **PROBLEM/OPPORTUNITY**

Induction of new, logistically unsupported equipment into the Fleet results in the creation of costly logistic tails which include: test equipment, allowance parts lists, technical data packages, technical manuals, training, drawings, preventative maintenance documents, et al. In most cases, new HM&E equipment is introduced without the complete understanding of all associated logistics support costs required in order to provide effective life cycle support. Logistics costs are estimated to be approximately $150K per equipment (FY 2005 data). Considering the average number of new equipment entries to be approximately 2250 per year, the cumulative cost associated with developing the initial ILS for this new equipment is substantial.

Further complicating this situation is the large amount of HM&E equipment that has a small number of Fleet installations. More than 50 percent of all HM&E equipment installed on ships across the entire Fleet contains five or fewer installs. One can conclude that an increase in the Fleet population of a specific piece of best performing HM&E equipment will result in an increase in the overall ability of the ship to perform its mission.

Beyond significant acquisition cost factors, the proliferation of non-standard HM&E equipment has negatively impacted Fleet readiness via higher casualty report (CASREP) rates for low density equipments. Higher equipment population yields lower CASREPS. According to FY 2005 data, The DON experienced roughly 2.97 CASREPS per 100 installs, when there was only one unique install in the fleet as compared to .13 CASREPS per 100 installs, when there were greater than 100 installs in the fleet. These implications are significant. As a result of managing a growing inventory of non-standard, low-population equipments, the DON faces increased support problems, increased life-cycle costs, and reduced availability to the Fleet.

HM&E standardization faces challenges at several different levels, which spans from the ship design and procurement process, down to the selection of which HM&E equipment to install on a particular hull. The Navy is addressing these issues with the development of tools, processes, and approaches to implementing HM&E standardization. These approaches, particularly the realization of commodity-based contracts, must be pursued in a manner that balances acquisition costs and technology insertion with cost savings and/or readiness improvements. Significant value can be gained if we take advantage of these design-stable standardization opportunities.

HM&E Standardization can significantly reduce the acquisition and life-cycle cost of the ship, from design to procurement, through manufacturing, and all the way to decommissioning. The challenge is to deliver/sustain the right standardized equipment and ILS that meets the technical acceptance requirements, on time, and at optimum value.

- **DESCRIPTION**

To mitigate mission degradation and lower logistics support costs for HM&E equipment, the Maritime HM&E Standardization Governance Board (GB), co-chaired by the Naval Sea Systems Command (NAVSEA) 04L and the Naval Supply Systems Command (NAVSUP) Vice Commander, is developing enterprise policies, tools and processes that will significantly reduce the number of non-standard HM&E procurements and installations.

The GB is working to improve HM&E standardization across maritime platforms using a strategic approach comprised of commodity-based contractual vehicles and informational tools to be used to maximize best value standard equipment installs during new construction, maintenance and modernization.

Four strategic Working Groups have been established to address specific business process challenges and crafted additional strategies for achieving the right mix of standardization. The overall DON HM&E standardization effort has significant potential benefits with respect to time, cost and readiness associated with various lines of operations (technical management, engineering, procurement, inventory management, production and maintenance).

- **NOMINEE INVOLVEMENT**

Mr. James Komaromy, DSCC Mechanicsburg, oversees the development and execution commodity contract vehicles based on industry best-practices for supply chain management. Best value commodity contracts act as the "point of the spear" and are designed to improve the manner in which the Navy procures HM&E commodities. Mr. Komaromy has provided exceptional leadership and direction in the development and execution of the commodity contracts. He has been instrumental in the molding and shaping of commodity contract policy and plays a major role in the development of a process that will allow customers to place orders electronically. Use of the electronic ordering (via the DOD e-Mall) will eliminate touch points, reduce workload and streamline the ordering process.

Mr. Steve Case, NSLC, N50, has provided exceptional leadership and direction as the Co-Lead the Best Value effort. He was instrumental in breaking the barriers associated with the development of the best value algorithm and process. He oversaw the successful development of the best value tool and was directly responsible for ensuring the process, testing and implementation was completed successfully, within budget and on time. Mr. Case continues to provide outstanding support to the HME Standardization efforts and is instrumental in solving problems, providing briefings to senior leadership and following-up on GB actions.

Mr. Charles Simmons, NSWCCD-SSES, oversees the Naval Sea Systems Command (NAVSEA) effort to provide analysis of equipment currently installed on active Navy ships. Mr. Simmons efforts allowed for the identification of valves for the initial Navy-wide standardization effort as they represent the largest number of equipments (2,275,141) installed. Mr. Simmons oversees a team of individuals whose job it is to provide standard Navy procurement specifications for the NSNs included under specific commodity contracts. He coordinated the DLA DSCC and NSWCCD-SSES technical support for commodity contracts. Mr. Simmons is instrumental in the identification of additional commodities to be pursued for future efforts, completion of interchangeability reviews and pre/post award technical support.

Mr. Tim Rose has provided exceptional leadership and direction as the Co-Lead the Best Value effort. He was instrumental in breaking the barriers associated with the development of the best value algorithm and process. Acting as the Governance Board Action team Lead, Mr. Rose provides outstanding administration and project management support to the Navy

Standardization Governance Board and the Co-Chairs (NAVSUP Vice Commander, Mr. John Goodhart and NAVSEA 04L, RDML Kalathas. Mr. Rose oversees the scheduling, coordination and development of the quarterly Gov. Board meetings, agendas and working group briefs to the Gov Board. Mr. Rose plays a pivotal NAVSUP role in the development of the commodity contracts initiative and the best value process.

Ms Vickie Cavanagh has provided exceptional support in the Best Value algorithm development. She was directly involved in the development of the Best Value Tool. She performed the initial development of the best value test bed and was directly responsible for the successful programming of the best value algorithm and production system. She is a pivotal player in the identification of commodity contract candidates and acts as the "data point" for future candidate analysis. Ms Cavanagh continues to support standardization efforts by providing data mining and analysis for all HME Standardization efforts.

OUTCOME:

With guidance from the HM&E EXCOMM GB, the combined effort of the HM&E standardization initiatives allows for a more coordinated and comprehensive effort to effect HM&E standardization into the Navy HM&E equipment selection and installation processes.

The commodities management team awarded additional commodity contracts covering over 380 different valves, and is moving forward with new commodity contract efforts. The commodity contracts partnering effort with SUP, DLA and SEA resulted in the award of over 5 contracts, valued at more than $26M over five years.

- Goal is to standardize to equipments that represent best value in terms of life cycle cost (vendor quality, pricing, maintenance costs, etc.)
- Rather than ordering many similar items for maintenance or new installation, the Commodity Contract permits all activities to buy same item from the same contract (increased efficiency, reduced touch points, single contract authority).
- Standardized Best Value items on contract have increased reliability (less time spent in maintenance.
- Procuring items already existing in the supply system avoids the cost of developing additional ILS (part, pubs, tooling, training, etc.)

All of the WG efforts are focused to meet the objectives and goals set forth by the HM&E EXCOMM GB, which are in alignment with the CNO goals and objectives. Reduced TOC, improved Fleet support, and increased mission readiness are some of the resulting benefits of standardization. In the end, it's providing the deck plate sailor the equipment that allows them to accomplish their mission.

- **PAYOFF:**

The effort allowed for the selection of valves manufactured by optimal valve supplying companies to fulfill these contracts. While the engineering analysis is not yet completed, there is a major benefit to standardization. Over 6500 potential candidates could be replaced by the 382 standardized best value valves. This represents an 83% reduction. Using a sample item for a reduction review, results indicated that one Commodity Contracts valve has the technical potential to replace 28 similar valves. This sample best value item represents 40% reduction in yearly sustainment costs and 25% reduction in down time.

The cost associated with developing the initial ILS for new equipment averages $370M annually. 2250 pieces of new HM&E items are introduced annually. Each set of ILS products cost the government approximately $148K. Efforts to maximize best value standard equipment installs during new construction, maintenance and modernization will result in significant cost reductions. Even a 1% reduction in the introduction of new HME equipments will result in $3.3M cost avoidance of ILS.

- **CURRENT STATUS:**

Commodity Contracts (On-going): The HME ordering corridor was stood up on 17 July. The commodity contracts management team is working with DLIS and the Phase 2 Valve commodity contractors to load product description data / information from the contracts on to the HM&E corridor. This will enable electronic ordering by the private shipbuilders and private shipyards.

Best Value Tool: The team's major focus is following-up on the feedback received from the initial pilot NNSY and MARMC. After incorporating changes and data from the latest Commodity Contract, the Best Value tool will initially be implemented at the NNSY and MARMC. The remaining NSYs, RMCs, Planning Yards, and the Planning Yard drawing system ISIDS will follow. Training and access to the Best Value tool will be provided to all necessary NSY and RMC personnel.

PROBLEMS IN EFFECTING SOLUTION:

Barriers in effecting solutions to HME Standardization are regularly discussed and addressed by the HME Std. Governance Board. The GB is comprised of multiple stakeholder commands that participate and/or contribute to HM&E standardization processes. Each of these commands continues to operate in accordance with their tasking and directives through their respective chains of command to address barriers and challenges.