The Planned Maintenance System:
Modernizing Procedures to Sustain the Navy’s Biggest Assets
FORCE COMMANDER’S CORNER
Vice Adm. Michael J. Connor, USN
Commander, Submarine Forces

Submariners,

This edition of UNDERSEA WARFARE Magazine highlights a few of the foundational principles that underpin our success as a force: understanding and celebrating our heritage as Submariners, identifying and developing future Submarine Force leaders, and continuously improving the way we do our day-to-day business on the deckplate.

In the past two decades, we have seen incredible advances in sensors, autonomous control systems, and information technology. Interestingly, many of these advances have been driven by industry, and most were actually developed not for military application but for commercial use. This represents a significant departure from how we have identified, developed, and integrated new technology in the past, and it demands a fresh look at how we do business and maintain our technological advantage moving forward.

The Submarine Force is on the forefront in this area. The Undersea Domain Campaign Plan articulates a vision for the future of Undersea Warfare in 2025 and describes the capabilities and partnerships we are pursuing to make this vision a reality. Many of those capabilities are being prototyped today in our Undersea Rapid Capabilities Initiative program. The next big challenge is streamlining the transition of mature capabilities to funded programs of record to achieve integration with existing systems, training, technical support, and logistics sustainment.

Equally important to our future is how we approach the challenge of operating and maintaining new technology. On submarines, we don’t have the luxury of simply adding another operator or maintenance technician to do this—there’s no room and no more racks. Instead, we demand that our crews continuously embrace, adapt, and integrate new tools, systems, and operating equipment in our day-to-day operations, in our maintenance management systems, and in our qualifications and training practices. To do this successfully, I expect our leaders to relentlessly resist counterproductive demands on our Sailors’ time and carefully manage the pace of integration of new technology. In short, we need to find ways to develop and use technology in a manner that simplifies and improves our ability to do the job of submarining. If we get this right, I am confident that the talented Sailors we bring in to the Submarine Force will readily match technological advances with operational performance improvement and keep us at the forefront of global submarines.

The preventive maintenance system has undergone a major overhaul over the last 20 years from a paper-based system to a digital-based product facilitating easier use and execution. These changes have improved the management of the system to a large degree but have lagged in technological and societal changes in the way we learn and the way we manage systems across multiple diverse platforms. William Kelly’s article on modernizing the Navy’s Planned Maintenance System addresses how our Fleet Commanders, in partnership with NAVSEA, are addressing this challenge head-on.

In May, we showcased some of the Submarine Force’s best young leadership talent when 18 of our junior officers traveled to Washington, D.C. for the Junior Officer of the Year recognition ceremony. These young men, each with stellar records, represented the Submarine Force with great dignity as they toured key sights in the Capitol area, met with Navy leadership, and networked with industry. These tours are part of the Submarine Force’s commitment to build our future leaders. The Submariner leadership talent pool is robust and will continue to deliver the next generation of Submarine Force leaders.

The Submarine Force is performing well, and I am immensely proud of the accomplishments that Submariners have achieved over the last two years in operations, maintenance, training, and force development. As I look to the future, there is no doubt in my mind that the positive trajectory of our crew training, our innovation, and our readiness will improve even further as we transition to the next generation of Submarine Force leaders. It has been an honor and a pleasure to serve as your commander. I wish you all the best and know that you will continue to do the incredible job our nation has come to expect of you.
“Numerous undersea stakeholders contributed to these major accomplishments, and I congratulate you all on a job extremely well done!”

Undersea Warfare,

It has been a very busy and exciting summer in the Submarine Force. This month, PCU John Warner (SSN 785) was delivered to the fleet under budget, more than two months earlier than its contractual delivery date, and with the highest quality ever as rated by the INSURV board of inspectors. She is the 8th consecutive Virginia-class to deliver ahead of schedule, culminating five years of work by the Virginia-class Program Office, the shipbuilders, Supervisors of Shipbuilding, and the rest of the Navy team including a crew of more than 135 Sailors. Named after the five-term U.S. Senator from Virginia and former Secretary of the Navy, she will be the first of the Virginia-class to be homeported in Virginia.

Also this month, the Chief of Naval Personnel announced the names of the first enlisted women who will convert to submarine ratings and report for duty on the blue gold crews of USS Virginia. This journal will also draw upon the Submarine Force’s rich historical legacy to instill a sense of pride and professionalism among community members and to instill pride among women.

In keeping with UNDERSEA WARFARE Magazine’s charter as the Official Magazine of the U.S. Submarine Force, we welcome letters to the editor, questions relating to articles that have appeared in previous issues, and insights and “lessons learned” from the fleet.

UNDERSEA WARFARE Magazine reserves the right to edit submissions for length, clarity, and accuracy. All submissions become the property of UNDERSEA WARFARE Magazine and may be published in all media.

Please include pertinent contact information with submissions.
In August of 1893, Congress appropriated funds to build an experimental submarine and invited interested parties to submit plans for the construction of the vessel. At the time, John Philip Holland, one of the best-known submarine proponents in the United States, was financially strapped. He needed about $350 to prepare and submit the plans to the Navy. Lunching with a young lawyer he explained his financial difficulties—telling the attorney he needed $347.19 [$11,700 in 2015 dollars]. The lawyer, intrigued with the exactness of Holland’s needs, asked him what the 19¢ was for and “quick as a flash [Holland told him it was] needed to pay for a particular type of ruler necessary to draw the required plans.” Holland was known for his exactness. The lawyer put up the money, for which he received “a good sized block of stock in the Holland Boat Company which in later years made him a multi-millionaire.” John Holland’s plans won the award and the Navy appropriated $200,000 to build a sub.
In an interview in 1900, Holland related that he was born in 1841 in Cork, Ireland, where he grew up to become a school teacher. As a young teacher, he was captivated by the newspaper reports of the battles between the Monitor and Virginia (i.e., Merrimac) during the American Civil War. The battle so inspired him that he "thought it ought to be possible that a boat could be made that would go underwater..." At first he thought it absurd and impossible...finally, completed a design that embodied most of the principles developed later in the present boat. Still living in Ireland, he placed the plans in an envelope and mailed them to Capt. Edward Abbot, a young teacher, where he grew up to become a school teacher. As a young teacher, he was captivated by the newspaper reports of the battles between the Monitor and Virginia (i.e., Merrimac) during the American Civil War. The battle so inspired him that he "thought it ought to be possible that a boat could be made that would go underwater..." At first he thought it absurd and impossible...finally, completed a design that embodied most of the principles developed later in the present boat. Still living in Ireland, he placed the plans in an envelope and mailed them to Capt. Edward Abbot, a young teacher, who had served as a Colonel in the Confederate Army and later chaired the Naval Ordnance Department who formally acquired the boat at its own expense, in which I should be permitted to have a hand in the design and construction of the submarine. The envelope and "thought little more of them" during the American Civil War. The battles of the Monitor and Virginia were either "laughed at by incredulous experts." The Navy formally purchased the boat in 1886 a new company was formed by Capt. Edmund Zalinski, inventor of the dynamite torpedo gun, to further Holland's ideas. A submarine was built but was accidentally destroyed at its launching. The following year, a new company was approached by three officers of the Naval Ordnance Department who had asked then-Navy Secretary William C. Whitney to appropriate discretionary funds to construct a submarine. An appropriation was approved but a change in political parties diverted the funds. Finally, in 1889, after several setbacks, an appropriation was again made, and in 1895 John Holland finally contracted with the Navy to construct the SS Plunger.

One interesting obstacle that he had to overcome was the concern of Secretary of the Navy Hilary Herbert who "feared a disast're like that of the Civil War [Confederate submarine] Housatonic, [believing that] any underwater vessel surely would be endanger'd by the explosion of its weapon." However, he had served as a Colonel in the Confederate Army and later chaired the U.S. House of Representatives Committee on Naval Affairs. He served as Navy Secretary under President Grove Cleveland.

In order to address Heber's concerns, a watertight tank with a car, a rooster, a dove, and a rabbit was submerged and inflected damage. "Like Moses who never saw the Promised Land, John Holland never witnessed the actual combat use of his invention. John Holland died on August 12, 1914, two weeks after the start of WWI. He was 74 years old. He was not able to see the actual combat use of his invention. Like Moses who never saw the Promised Land, John Holland never witnessed the actual combat use of his invention. John Holland died on August 12, 1914, two weeks after the start of WWI. He was 74 years old.

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Even with more than 10,000 service men and women working in the D.C. area, it is still unusual to spot a group of submarine lieutenants walking the halls of the Pentagon and streets of the capital in Service Dress Blues! In April, seven Submariners (and one lonely Surface Warfare Officer) and their families made their way to Washington, D.C., to be recognized as the 2014 Junior Officers of the Year (JOOY), an honor reserved for only the best junior officers each submarine squadron and sub tender has to offer. The JOOY program recognizes junior officers of the Submarine Force who demonstrate superior seamanship, management, leadership, and tactical and technical knowledge. Submarine candidates are nominated by their boats’ junior officers and commanding officers and selected by the squadron commanders. Submarine tender candidates are selected by the ship’s commanding officer.
Some of the JOOYs said selection for the award came as a bit of a shock, citing the strong competition from other junior officers on the waterfront. “At first I thought it was a mistake,” said the Submarine Squadron 16 JOOY, Lt. Brian Bink. “I had been in the shipyard for the last two years, competing against JOOs who had just returned from successful SSGN deployments.” For the spouses, they shared in the excitement of the news that their spouses were selected. “He is very humble, so he won’t say it,” Mrs. Gretchin Normand said of her husband Lt. Mitch Normand from Submarine Squadron 29, “but it is a huge honor, and I am very proud of him and what he was able to accomplish.”

The annual trip provides an opportunity for the junior officers to sit down with senior leadership to discuss the current challenges and the future of the Submarine Force. They also get a well-deserved break from their hectic schedules on their boats to tour the Pentagon and other historic landmarks in D.C. with their families. This year’s trip included personal guided tours of the Pentagon, Library of Congress, the Naval History and Heritage Museum, and the Naval Observatory.

It was impressive to see what we have the potential to do, and I hope to see those innovations in the fleet soon,” said Lt. Ben Reed, JOOY for Submarine Squadron 4. Some successful programs to already transition from Area 51 to the fleet include the touchscreen wardrobe table and replacing the photonic periscope handgrip and control panel with an Xbox controller starting with PCL 45 (SSN 788).

The trip to D.C. allowed each JOOY to share experiences with one another to gain insight on common challenges of being a junior officer. “You tend to get tunnel vision or being on the submarine,” said Lt. Aaron Kalfus, JOOY from Submarine Squadron 7. “Just when you learn what to do and get comfortable, you are moved to a different job.”

A common theme shared between the JOOYs was the demand on their time on a daily basis and being able to learn all the different aspects of their jobs in such a short period of time. “The most challenging aspect of my JO tour was learning how to work with such a variety of people in a plethora of different situations,” said Lt. Aaron Kalfus, JOOY from Submarine Squadron 7. “Just when you learn what to do and get comfortable, you are moved to a different job.”

Lt. Aaron Kalfus and his wife Sarah at the Naval History and Heritage Museum.

For some, the trip was a unique behind-the-curtain look at how major programs are developed start to finish. The group had the opportunity to sit down with Rear Adm. Joe Tofalo, Director of Undersea Warfare Division (OPNAV N97) and the undersea warfare requirements officers to discuss priorities, and current and future submarine programs. Rear Adm. Tofalo stressed how each person at every level contributes to the success of the Submarine Force and programs. “The hard work and dedication each of you put in on a daily basis to complete availabilities on time and keep our boats at sea gives Congress and the American people confidence and demonstrates the Submarine Force’s high return on investment,” he said. “Nothing breeds success like success.”

The junior officers also toured Lockheed Martin’s facility in Manassas, Va. Here they got a first-hand look at how the next generation Acoustic Rapid Commercial OfftheShelf Insertion (A-RCOI) systems are developed, tested, installed, and supported through their lifecycles. Here they also had a rare opportunity to tour Lockheed Martin’s peculiarly named “Area 51.” Inspired by the TANG project (see UNDERSEA WARFARE Magazine’s Summer 2013 edition), Area 51 provides a test bay that allows developers and fleet customers to try out a variety of commercial technology in the physical constraints of a Los Angeles-class and Virginia-class submarine control room, warroom, and bridge.

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On February 17, 1864, the Confederate submarine H.L. Hunley attacked USS Housatonic, a federal sloop of war participating in the blockade of Charleston, South Carolina. The explosion resulting from the Hunley’s torpedo sank the 1,240-ton ship in a matter of minutes, securing Hunley’s place in history as the first submarine to sink an enemy combatant. Although the attack on Housatonic was successful, Hunley was lost at sea due to unknown circumstances with no survivors. Though various theories about the cause of Hunley’s loss have existed for some time, the sequence of events during and after the attack remains a mystery.

In 1995, marine archaeologists sponsored by author Clive Cussler located Hunley’s wreck off the coast of Charleston approximately 1,000 feet from the wreck of Housatonic. Five years later, Hunley was raised from the sea bottom and moved to a specially prepared tank facility at the Warren Lasch Conservation Center (WLCC), located at the Charleston Navy Yard. Once there, a team of archaeologists and conservators from Clemson University began working on studying and preserving the submarine.

**What Happened?**
Motivated by recent archaeological findings made at the WLCC, engineers in the Naval Surface Warfare Center Carderock Division’s Survivability and Weapons Effects Department hope to shed light on what may have happened to Hunley and her crew using the Navy’s most advanced modeling and simulation software and computational capabilities.

Recently, archaeologists at the WLCC uncovered a long iron pole of a spar torpedo system. It had been previously thought that Hunley used a line-operated torpedo system—one that was operated from a distance using a trigger to set off its explosive charge. In contrast, Civil War-era spar torpedoes usually consisted of an explosive charge fastened to a fixed-length spar and initiated by a contact fuse. Thus, Hunley would have been separated from the explosive charge only by the spar’s length, 16 feet, thus generating a more severe loading environment than that from a line-operated system. The Confederacy’s largest spar torpedo, Singer’s torpedo, consisted of 135 pounds of black powder. In this current study, the use of Singer torpedos is assumed; while it is possible a different design was used, the largest available spar torpedo was selected to bound possible outcomes.

**The Team and the Tools**
Realizing the significance of this finding, researchers at the WLCC, together with Dr. Robert Neyland, head of the Underwater Archaeology Branch at the Navy History and Heritage Command, contacted the Naval Surface Warfare Carderock Division (NSWCCD) for assistance in interpreting the implications of this finding on Hunley. Fortunately, Carderock’s Survivability and Weapons Effects Division—which performs analyses, testing, and vulnerability assessments of underwater and air-delivered threats on Navy ships, Marine Corps vehicles, and other structures—possesses the necessary computational capabilities to evaluate Hunley’s attack on Housatonic using advanced modeling and simulation tools.

With financial support from both the Office of Naval Research (ONR) and the internal NSWCCD research funds, engineers began applying a newly developed high-fidelity modeling and simulation tool, Nav Enhanced Sierra Mechanics (NEMS). This tool, developed jointly by Sandia National Labs and Carderock, consists of a structural simulation Finite Element code, Sierra Mechanics, fully coupled to a computational fluid dynamics shock-physics code for underwater explosions, DYSMAS/FD, developed by the Naval Surface Warfare Center Indian Head EOD Technology Division (NSWCEEDT). Using NEMS, the fully coupled interactions between explosive products, water, and the responding structure can be captured. These features are critical to obtaining the correct response of a floating or submerged structure to an underwater explosion event.

To perform numerical analysis of a ship, submarine, or other platform in NEMS, an appropriate numerical description, in the form of a finite element model (FEM), is required. The FEM consists of a numerical description that includes both geometric and material properties. Archaeologists at the WLCC were able to provide the necessary details to develop the FEM including photos, drawings, and geometric point-cloud scans of Hunley generated using both structured light and laser scan techniques. The scans provided the submarine’s shape and dimensions and were used to generate an FEM of Hunley. In addition to the FEM, the project

**H.L. Hunley**
The design and construction of the Confederate “secret weapon” was based on earlier prototypes from plans by Horace L. Hunley, James McClintock, and Baxter Watson. The vessel tapered sharply at the bow and stern and was constructed of 3/8-inch-thick riveted iron plates that were tapered fore and aft to provide “streamlining,” allowing her to move fairly easily beneath the water’s surface. The final configuration was about 40 feet long, 3.5 feet wide, and 4 feet high amidships. The vessel was powered by seven men turning an offset hand crank that ran most of the length of the interior and turned a single screw propeller. The vessel was steered with a tiller-like rod that controlled the rudder and a second rod that controlled the outside diving planes. Ballast consisted of 4,000 pounds of iron blocks bolted to the bottom of the hull. Tanks at either end could be flooded manually with seawater allowing Hunley to submerge. Hand-operated pumps were used to expel water to allow her to surface. Depth was indicated by a mercury gauge, lit by a single candle. Two conning towers, some 16 feet apart, were fashioned with a number of small viewing ports. Each tower was capped by a 20-inch hatchway sealed with rubber gaskets.

Her sole armament was a torpedo (also known as a mine) at the end of a 16-foot spar extending from the bow. The Hunley rammed its spar torpedo into the starboard stern of the USS Housatonic hull, setting off the explosive. Originally called “Fish Torpedo” or “Fish Boat,” the Hunley was built in Mobile, Alabama, and loaded on railcars for the journey from Mobile, Ala. to Charleston in August 1863 for anti-blockade duty.
In contrast to a high explosive, however, the observed pressures were found to be modest and result in a steady heaving motion of Hunley. Furthermore, simulations indicated that the hull would not exhibit structural damage. This finding is consistent with the lack of structural damage observed on Hunley’s hull but not intrusive given the submarine’s close proximity to the explosion. In contrast, the bubble resulting from the explosion’s reaction products was found to be in Hunley’s hull but not intuitive given the result of black powder’s slow-burning nature. The explosion’s reaction products was found to be in Hunley’s hull but not intuitive given the result of black powder’s slow-burning nature. In addition to Carderock’s effort, a separate ONR-funded effort being performed by Dr. Matthew Collerette of the University of Michigan Department of Marine Engineering and Naval Architecture is examining the weights and stability of Hunley’s design, as well as paths in which the boat may have sank to its final resting place. This effort already has found that even a small inflow of water or an unstable trim state resulting from the heaving motions during the attack could have resulted in Hunley’s sinking. Once the current analysis efforts are completed, Carderock engineers should be able to uncover the mystery of why Hunley sank. In addition, the continued development of modeling and simulation capabilities to perform advanced analyses such as those described above will facilitate an ever-increasing ability to design against or evaluate future threats to the Navy.

About the third crew of the H.L. Hunley

Eight men were aboard the Hunley when it sank for the third and final time. The submarine was raised in 2000 and the crewmembers were reinterred with the first two Hunley crews in Magnolia Cemetery, Charleston S.C. on April 17, 2004. Seaman Arnold Becker, at 5’9” and around 20 years old, was perhaps the smallest and youngest crewmember of the H.L. Hunley. He was seated directly behind Lt. Dixon and was most likely 3rd in command of the sub. Seaman Becker operated the bellows and snorkel tubes, which were the Hunley’s air circulation system that enabled the crew to replenish the air supply. Corporal J.F. Carlson was assigned to the fourth crank handle on the Hunley, a dangerous spot in case of an emergency evacuation. Based on documents found to date, Carlson’s official military records indicate he did, in fact, die on the Hunley. Seaman Frank G. Collins, Confederate Sailor from Virginia manned the third crank. Lt. George E. Dixon met Horace Hunley and James McClintock in Mobile, Ala. Their dream of building a submarine became his dream and he helped build and pilot two of these vessels. The second, became known as the “H.L. Hunley.” Seaman C. Lumpkin was probably around 40 years old making him one of the oldest crewmembers of the H.L. Hunley. He held the second crank position. Currently, little is known about him except the strenuous lifestyle the forensic analysis points to. Miller was one of the smaller and one of the two oldest members of the crew. He was from Europe and had been in America for a short period of time before he volunteered as a crewman for the Hunley. His only duty was to operate the fifth crank position. Quartermaster Joseph Ridgaway was second in command. He was responsible for securing the aft hatch, manning the seventh crank, operating the aft pump and the ballast tank seacocks. Boatswain’s Mate James A. Wicks was assigned to man the Hunley’s sixth crank position. Wicks’ responsibilities included operating the crank and, in case of emergency, he was to release the aft keel block. During excavation, a keel release mechanism was found below the station manned by Wicks.
In 1963, the Beatles recorded their first album, a gallon of gas was 29 cents, and…

The U.S. Navy established the Planned Maintenance System (PMS). PMS was a plan formulated to keep the seafaring branch of the U.S. Armed Forces operating smoothly. According to A.J. Ruffini’s article from Bureau of Ships Journal, Nov. 1963, previous maintenance programs were “non-uniform…resulting in over maintenance, under maintenance or improper maintenance that often contributed to rather than prevented casualties.” Also, “Myriad reports were so unrealistic and unmanageable” and “varying and conflicting maintenance documentation resulted in confusion.” A change was needed, and PMS was born.
The need for a more robust approach
PMS manages organizational-level (O-level) maintenance for the Navy’s ships and shore-based systems. It was created at a time when Navy leadership recognized that locally managed preventive maintenance was not robust enough as system complexity increased and the Navy’s investment in technical schools and training decreased. Equipment readiness was potentially compromised as each ship’s crew searched through various technical manuals to figure out what preventive maintenance should be performed. Over time, PMS added tools and procedures to manage preventive maintenance more effectively.

The PMS program introduced maintenance requirements, standard procedures, a standard organizational maintenance structure for ships and a common practice to manage work center schedules—all facets that are still a part of PMS today. Leadership was also able to determine the amount of time needed to perform the maintenance and estimate the man hours based on a ship’s total manpower. This made work centers more accountable for PMS and allowed fleet commanders to monitor and manage the program. Information technology (IT) was still new when the PMS program rolled out, so, to accomplish maintenance, shore support had to rely on labor-intensive processes like a punch card data processing system to develop and distribute the initial PMS documents as well as make changes to requirements and procedures. As IT advanced, these PMS processes improved and costs were reduced. Some of these improvements included:

• In the early 1980s, the PMS program started using an early version of word processing to better manage maintenance documents that had frequent changes. The structure of PMS documents has remained essentially unchanged.
• In the early 1990s, high-speed printers became available allowing the program to adopt the idea of “print-on-demand” maintenance procedures. This meant that you could switch from print-to-stock and warehousing to distribution with digital media.
• Over the course of the 1990s, the program developed new databases for managing the maintenance requirements and accompanying procedures.
• In the early 2000s, the program developed and enhanced the process of shipboard scheduling by creating a standardized electronic shipboard scheduling program, also known as SKEED.

One thing to note about all of these enhancements is that each one was focused on one area of improvement and not the entire maintenance process. PMS is still executing ship-implemented, paper-based maintenance that causes scheduling inconsistencies across the fleet.

Feedback to NAVSEA is being implemented
There are certainly more areas that need improvement, and Naval Sea Systems Command (NAVSEA) is listening to the needs of Sailors. After receiving feedback from the CNO Reduce Administrative Distractions (RAD) initiative of 2013 and the Commander Naval Surface Force Pacific (CNSP) Maintenance and Material Management (5-M) Summit Survey of 2014, as well as years of interactions with maintainers, three large issues have been confirmed with the current PMS program: it’s complex and burdensome, IT infrastructure and tools are dated, and policy is outdated.

Optimizing PMS to reduce burdensome processes for Sailors is one of the goals of NAVSEA’s U.S. Fleet Forces Command and Commander Pacific Fleet. Improvements such as Fleet Maintenance Effectiveness Review (FLEETMERE) and SKEED have been highly successful. In the last ’90s, the

2020 Vision—Why We Need the “Future of PMS”
by Jeffrey Baur, U.S. Fleet Forces Command (USFF) Fleet Maintenance Division

Have you ever driven your car and thought that something wasn’t right? No warning lights are coming on. You just changed the oil. The tires are new. Still, you know something’s wrong. You take it to your favorite mechanic and he finds several issues. Maybe individually they’re no big deal, but put them together and you know it was only a matter of time before this car was going to leave you stranded somewhere. Good thing you had that uneasy feeling.

Well, U.S. Fleet Forces Command had that uneasy feeling in 2010 about the Navy’s Planned Maintenance System (PMS). Sure, on the surface everything seemed fine, but a closer look revealed a number of problems. Excessive work for Sailors, equipment not reaching its expected service life, and degraded readiness of ships, if left uncorrected, would eventually lead to an unsustainable fleet.

At the Fleet Maintenance and Material Management (3-M) Conference in the fall of 2010, attendees were challenged to envision what they thought shipboard maintenance should look like in the year 2020. This 2020 Vision project team proceeded to identify the critical attributes of an effective maintenance program and then compared it to what we have today. Of course, the Navy, and society as a whole, has changed in many ways since 1990. The Navy people learn and communicate has certainly evolved since the 1960s, as well as a Sailor’s expectations toward technical products. What may have worked 50 years ago or even five years ago may not be the

At the core of our efforts are three governing principles:

• Make it easy for every person involved in PMS to do the right thing and, conversely, make it hard to do the wrong thing.
• Do something once and re-use it for the remainder of the maintenance process.
• Eliminate process steps that don’t add direct value to maintenance effectiveness.

Out of the 2020 Vision project came the current “Future of PMS” (FoPMS) project. Guided by these principles, FoPMS is bringing the much needed improvements to PMS. The development is funded by OPLAN beginning in FY16 and will take six years to complete the full rollout to the fleet. Due to the sweeping nature of this initiative, several key components will require development in conjunction to the PMS program we are currently executing. Other parts of the project, like SKEED 3.2 and Tailored Force Revision (TFR) are already in use, and additional elements, such as changes to Maintenance Requirement Card content, will be delivered during the development as they become available for distribution.

As mentioned before, using the latest technology to improve PMS is critical. Enabling the use of emerging technology when it becomes available is a key component of the FoPMS project’s mission. Currently, we are participating in the Navy Mobility working groups and providing functional system requirements to those responsible for developing mobile technology to the fleet. In addition, we are ready to support Item Unique Identification (IUID) to enable scanning items to bring up applicable technical documents and allow deficiency reporting.

In 2013, Commander, Naval Sea Systems Command (NAVSEA), approved FoPMS as the way ahead in contributing to NAVSEA’s strategic goal of reimagining shipboard maintenance. Later in 2013, Commander, U.S. Fleet Forces Command (USFF), was briefed regarding FoPMS, and his direction was simple: “Execute and accelerate.” The Future of PMS is now getting the approval to achieve success.

Before defining the details of the FoPMS project, it’s important to know a few things. First, we are doing this to improve the efficiency and effectiveness of the Navy’s PMS. Our ultimate goal is to improve warfighting readiness by allowing Sailors to focus on what is really required in PMS and to provide some flexibility in how it is executed.

Now comes the hard part. You need help. Several experienced people with years of PMS expertise have identified what needs to be done. Dozens more have developed the FoPMS plan. To make this program happen and be successful, however, we need you to review their work and provide your input. We recognize that you, the active duty Sailors, are the ultimate judges on whether or not we got it right. We are standing by for you to tell us what you think and, more important, what you need. There are many ways to have your voice heard. First, we’ve opened a milBook page where you can check out the latest updates, watch videos, take surveys, and open up discussions. It takes about 30 seconds to register. Just go to https://www.milsuite.mil and search for “Reimagining Shipboard PMS.” If milBook isn’t your thing, just send an e-mail to pms@navy.mil and tell us what’s on your mind.

20/20 Vision—Why We Need the “Future of PMS”
This modernized system is an evolution of existing programs that will transform PMS from a paper-based system to digitally enabled with enhanced workflows, data reporting, and near-real-time distribution of technical requirements.

Modernizing PMS

In the past year, NAVSEA and the fleets kicked off a multi-year project to modernize and improve the PMS program. It’s called the Future of PMS (FoPMS) and its ultimate goal is to form a cohesive PMS program that leverages automation and process streamlining to reduce administrative burden and support Sailors in effectively maintaining the fleet.

SKED, the Navy’s PMS scheduling software, was born in the late 70’s when ships began to be outfitted with personal computers. The earliest versions were a bit clunky to use but did alleviate some of the paper work. As SKED was refined, version 3.1 became mandatory to use across the fleet in 2004. SKED 3.2, introduced in 2008, was developed and deployed to provide a modern, configuration-centric process.

Recent updates to SKED include leadership dashboards, equipment-based schedules, true interval scheduling, situational maintenance scheduling improvements, and electronic line-outs, approvals, and workflows. Future versions of SKED will continue to improve with features like custom views and reports, flexible PMS checks, accomplishment raising enhancements, and managing Advance Change Notices within SKED.

Another toolset whose data will be incorporated into FoPMS is the Tailored Force Revision (TFR). Deployed in 2010, TFR packages reduce the administrative burden of implementing PMS changes by performing up to 70% of the work ashore before being sent to the ship. It’s an enhanced Force Revision (FR) package tailored to each work center supervisor (WCS). The TFR templates have been developed as a result of the past and melds them with new ideas and technologies. For example, FoPMS will see a modernization of SKED. Configuration-based O-level maintenance plans will be provided from ashore with maintenance schedules that allow the WCS to easily assign resources and dates. Future versions of SKED will also provide optimal workload balancing tools, 3-M inspection tools, and the ability to consume the collection of material condition data.

FoPMS is real. However, it couldn’t happen without the programs that came before it and the current initiatives that are building toward its creation. It is a six-year mission in progress that won’t stop until all the goals are accomplished.

Updating policy is key to the FoPMS project. In 2014, two important entities were created to evaluate and approve policy changes that will shape FoPMS: the U.S. Fleet Forces Command 3-M Requirements Management Board (RMB) and NAVSEA’s 3-M Configuration Control Board (CCB). Basically, the RMB will identify and recommend policy changes to the CCB, which will then review and approve the changes. This establishes a governing body for FoPMS and benefits Sailors in a number of ways:

• Policy changes are made more quickly
• All 3-M policy will be standardized and aligned
• Administrative burdens such as printing requirements are reduced

features with near-real-time updates to keep procedures current and eliminate the need to make pen-and-ink changes.

Your part in shaping FoPMS

FoPMS is real. However, it couldn’t happen without the programs that came before it and the current initiatives that are building toward its creation. It is a six-year mission in progress that won’t stop until all the goals are accomplished. Of course, 50 years of Navy PMS couldn’t have happened without the guidance, hard work, and input from the many men and women who served.

This holds true today. As we look toward the modernization of PMS, we want to hear from the many Sailors whose opinions are so vital. While this was just a quick look at FoPMS, more information can be found at a devoted PMS milSuite site where you can see updates and videos and provide your thoughts. Just go to https://www.milsuite.mil and search for Reinvigorating Shipboard PMS. You can also email your ideas to pms@navy.mil. Your perspective will keep FoPMS headed in the right direction.
Enlisted Women Selected for Assignment to Submarine Michigan

The first enlisted women to serve aboard a submarine have been selected, the Navy announced June 22. In the program was strong, and selection was competitive.

Congratulations to the following sailors who were selected to be assigned to the ballistic missile submarine Michigan.

<table>
<thead>
<tr>
<th>NAME</th>
<th>COMMAND</th>
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<tbody>
<tr>
<td>FM1</td>
<td>Ebony Smith</td>
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<tr>
<td>PSI</td>
<td>Bethany Woodman</td>
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<td>ICD</td>
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<td>Ashley Crawford</td>
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<tr>
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<tr>
<td>LS3</td>
<td>Stephanie Young</td>
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<tr>
<td>HS1A</td>
<td>Rhia Zhu</td>
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Sailors push through foul weather to complete SUBASE Corpsman Challenge

Despite sporadic rainfall and unusually muddy obstacle courses, three teams from Naval Branch Health Clinic Groton (NBHC) competed in the 2015 Corpsman Challenge at Naval Submarine Base New London (SUBASE), June 1.

The teams, consisting of five members each, sprinted up and down a three mile course and used critical medical knowledge and skills to treat mock injuries ranging from minor burns to life-threatening puncture wounds at several stations along Perimeter Road and Rock Lake at SUBASE.

“Teams were challenged in the several areas of mass casualty response, including splintering, litter carry, administering intravenous needles (IV); low crawling; and medical evacuation knowledge. The challenge is a timed event and incentives are given for speed and accuracy. Team efforts at each station are scored. Teams are also awarded points according to their finish time.”

“Corpman Challenge is an annual event that is held during the month of June in honor of the舰长’s birthday,” said Master Chief Hospital Corpman (SCPO) Arden Carpenter.

Team “Corpman United” claimed victory in the competition and went on to represent the command at the Naval Health Clinic New England (NBHC) Corpsman Challenge in East Greenwich, R.I., June 5. The Sailors competed against hospital corpsmen assigned to Navy medical activities at Newport, Portsmouth and Saratoga Springs, June 5.

SUBASE Sailors participate in ESPN shoutout to deployed troops

In a Memorial Day tribute, Sailors assigned to Naval Submarine Base New London (SUBASE) and Virginia-class fast attack subma-
line USS Minnesota (SSN 783) joined ESPN SportCenter to honor the fallen and to give a shout out to service members deployed around the world, May 24.

“To thank those who have served and are serving our coun-
try this Memorial Day weekend, we invited military personnel to join us on ESPN SportCenter,” said Senior coordinating Producer Don Skiar. “We reached out to the different military services in the state of Connecticut and SUBASE answered our call.”

Representing Navy Team New London at ESPN were the follow-
ing Sailors: Sonar Technician, (Submarines) 1st Class Ryan Smith, Sonar Technician (Submarines) 1st Class Christopher Chase, Sonarman Regimental Pettway, Culinary Specialist 1st Class Joseph A. Rosalvitas, Machinist’s Mate 1st Class Maxwell Grey, and 1st Class Christopher Burns.

WELCOME HOME!  

Machinist’s Mate 1st Class Freddie Jones has his children during a homecoming celebration on the pier after returning from deployment aboard the Los Angeles-class attack submarine USS Honolulu (SSN 729). Jones returned home to Newport at Naval Submarine Base New London (SUBASE) after participating in deployment in the European Command and Central Command responsibility.”

Photo by Mass Communication Specialist 1st Class Jason Tenner

Retiring or Separating: Ensure Medical Records are Turned in for Future Care

Sailors are being reminded to properly transfer their medical and dental records are available to the Department of Veterans Affairs (VA) by returning them to their medical treatment facility at retirement or separation, Navy leaders said May 26.

A benefit service is a lifetime of support from the VA,” said Ann Stewart, director, Pay and Personnel Management. “To make sure Sailors can get the best level of support possible, they need to make sure their medical records have been turned in to the appropriate medical facility when they separate or retire from the Navy. A copy of medical and dental records will be provided to separating or retiring Sailors.”

Before a Sailor separates or retires, separating, command officers (COs) and officer in charge (OICs) are responsible for ensur-

ing Sailor’s medical department or medical treatment facility knows the Sailor is separating or retiring and sends them a copy of their Service Treatment Records (STR), medical and dental records are, and the appropriate medical and dental fa-
cilities. This guarantees that the records will be available to the VA. Medical departments or medical treatment facilities annotate on command,organization check sheets the disposition of the STR (per NAO117 8/7/14).

“There may come a time when you need to file a claim with the VA in the future, and they will check to verify your period of ser-
vice in the Navy,” Stewart said. “Making sure your record is left at the appropriate medical or dental facility when you leave the Navy means that the VA will have im-
mediate access to your records and can expedite care.”

Photo by Ann Stewart
Sailors stockdale ombudsmen of the year award 2015

The navy announced the Mrs. Sybil Stockdale Ombudsmen Award to formally recognize the contributions and obligations of ombudsmen across the fleet May 18.

The award honors Mrs. Sybil Stockdale’s support to families of other POWs during her husband’s - Vice Adm. James Bond Stockdale - seven-year internment in Southeast Asia during the Vietnam War. The award recognizes four of the Navy’s top ombudsmen who have served their command and families with selfless dedication and commitment to family readiness in three areas: Afloat command (Fleet Forces Command, both Atlantic and Pacific), Ashore commands under Navy Installations Command, and Navy Reserve Force commands. A Navy administrative message (NAVADMIN) informing the Navy about this new award was also released today.

The Ombudsmen of the Year award criteria include:
- Demonstrating the ability to effectively communicate between the Navy family and the command.
- Maintaining the highest standards of professionalism and confidentiality while providing a positive role model for command members and families.
- Facilitating and promoting a healthy sense of community among command families by assisting and supporting Navy families to include emergencies, mobilization or deployment.
- Demonstrating consistent compliance with training and required reports according to OPNAV/N7 756.10 (located at www.headquarters.navy.mil/OFFICE/NAVADMIN).

To be eligible for the award, ombudsmen must be registered in the Ombudsmen Registry, located at https://ombudmanregistry.navy.mil, and have distinguished themselves in roles supporting Navy families, served as an ombudsmen in good standing for at least 1year, and embody the core values of the Ombudsmen Program.

“We are pleased to have the opportunity to honor Mrs. Stockdale,” said Matt Straughan, director for the Navy’s family support programs for Navy Installations Command. “This award allows us to formally recognize the hard work and sacrifices made by our ombudsmen who support our sailors and their families world-wide.”

The Navy Family Ombudsmen Program was created in 1970 by Admiral E.R. Zumwalt Jr., then Chief of Naval Operations (CNO), to improve communication between commands and the families of Sailors who served in them. In 2006, CNO Admiral Michael G. Mullen re-emphasized the importance of the program and signed an updated instruction, highlighting the requirement that all Navy families have access to a Navy Family Ombudsmen.

The Ombudsmen is a volunteer, appointed by the commanding officer, to serve as an information link between command leadership and Navy families. Ombudsmen are independent volunteers both up and down the chain of command, including official Department of the Navy and command information, command climate issues, quality-of-life improvement opportunities and community resources. Ombudsmen provide resource referrals to families when needed and are instrumental in resolving family issues before the issues require more extensive command attention.

Selected to Flag Officer
Capt. Michael P. Holland
Capt. Thomas E. Fiehe
Capt. Jeffrey E. Tranier

Changes of Command
Trident Ballistic Facility, Kings Bay Capt. Guenter Ruemel relieved Capt. Larry Hill
COMSUBRON 21 Capt. Michael A. Piter assumed command
RSG GROTON/NSSE NILON Capt. Garthard Solidt relieved Capt. Richard Volrath.
US. Alaska (SSN 732) (B) Cmdr. David Forman relieved Cmdr. Todd Figuresham
US. Aragona (SSN 760) Cmdr. Kurt Balgepa relieved Capt. Charles Pelletier
US. Galespax (SSN 781) CMDR. BRADY Bommer relieved Capt. Steven Guerin
US. Columbia (SSN 771) Cmdr. David Edgarson relieved Cmdr. John Patrick Friedman
US. Florida (SSBN 720) (G) Capt. Bill McKinnon relieved Capt. Louis Mayer
US. Iowa (SSBN 720) Capt. Jason Kalmar relieved Capt. John Lawrence
US. Alaska (SSBN 732) Capt. Andrew Nagle relieved Capt. Karl Nilsen
US. Texas (SSBN 734) (B) Cmdr. Jeffrey Pinkel relieved Capt. John Bateman

US. Hampton Visits Yokosuka
The Los Angeles-class fast-attack submarine US. Hampton (SSN 767) arrived at Fleet Activities Yokosuka for a port visit as part of its deployment to the Western Pacific, June 8.

With a crew of approximately 150, Hampton will conduct a multitude of missions and showcase the latest capabilities of the submarine fleet.

“My crew is humbled and excited by the invitation to visit Yokosuka,” said Cmdr. Lincoln Reifsteck, Hampton’s commanding officer. “I have been impressed with the Japanese submarine force, their professionalism and skill. Strengthening our friendship as nations, and especially our partnership at sea, is vitally important for both countries and I’m proud to be a part of it.”

After a brief port visit in Okinawa, Japan, Hampton is looking forward to a second opportunity to experience the Japanese culture before heading back to sea. The crew will use the port call to re-supply, complete scheduled maintenance, communicate with friends and family, meet and greet Japanese submariners and enjoy some time off.

Cdr. David Forman, commanding officer of the Ohio-class ballistic-missile submarine US. Alaska (SSN 732) Blue crew, speaks with NATO Secretary General Jens Stoltenberg during a tour of the ship. Stoltenberg toured the Alaska while visiting commands throughout the southwest region.

Qualifed in Submarines
Lt. j.g. Robert Alvarado
Lt. j.g. Robert James
Lt. j.g. Ojevwe Avworo
Lt. Cmdr. Christopher Rose
Lt. Demitri Demetratos
Lt. Steven Demart
Lt. Cmdr. Andrew Smoots
Lt. John Elmaleh
Lt. j.g. Sinon Bennett
Lt. Cmdr. Christopher Wolf
Lt. Cmdr. David Feeney
Lt. j.g. Jeremy Morgan
Lt. j.g. Jeremy Pariot
Lt. James Dyer
Lt. Richard Hagen
Lt. Cmdr. Nathan Michaud
Lt. Andrew Miller
Lt. j.g. Thomas T. Thorne
Lt. Cmdr. Richard Younger
Lt. j.g. Anthony Elam
Lt. j.g. Anna E. Ecard
Lt. June Smith
Lt. j.g. William Holley
Lt. Cmdr. Dennis C. Gunther
Lt. j.g. Robert Bullard
Lt. j.g. Eric Johnson
Lt. Cmdr. John Eager
Lt. Cmdr. Xander Cheng
Lt. j.g. Robert C. Chumley
Lt. Cmdr. Michael Soares
Despite facing severe weather in port and at-sea, they completed three missions vital to national security, said Solomon. “The European Command area of responsibility, and also conducted nautical miles. Port visits were conducted in Haakonsvern, supporting national security interests.

As a result, the submarine was awarded the Commendation Medal, the Navy Commendation Medal, and the Meritorious Service Medal for their efforts. The crew displayed exceptional professionalism and dedication during their deployment.

The ship’s namesake, former President Jimmy Carter, and ship’s sponsor, former first lady Rosalynn Carter, also attended the event. “What makes me so proud is to have been the only submariner to have served as commander in chief and also to have a submarine named after me,” said Carter. “Of all the honors I have ever received, I’ve never had anything of greater honor than the chance to be the namesake of USS Jimmy Carter.”

During Ellowitz’s command tour, which began in March 2012, the submarine completed five missions vital to national security and underwent a 17-month-long docking phased maintenance availability period. In addition, Jimmy Carter earned the Battle Efficiency Award, or “Battle E,” for 2012 and 2013. The ship was honored with the U.S. Submarine Forces Pacific Retention Excellence Award for 2012 and 2014, as well as the crew being awarded the Presidential Unit Commendation and the Navy Unit Commendation. The Los Angeles-class attack submarine USS Pittsburgh (SSN 720) returned from a six-month deployment to its homeport at U.S. Naval Submarine Base, New London, Connecticut, May 12.

Under the command of Cmdr. Bill Solomon III, Pittsburgh returned from the U.S. European Command area of responsibility, and also conducted three missions vital to national security, supporting national security interests.

During the deployment Pittsburgh steamed more than 30,000 nautical miles. Port visits were conducted in Haakonsvern, Norway; Rota, Spain; and Falsad, Scotland.

“We conducted operations in the Atlantic Ocean within the European Command area of responsibility, and also conducted three missions vital to national security,” said Solomon. “The Pittsburgh crew performed extremely well during the deployment. Despite facing severe weather in port and at-sea, they completed all evolutions without incident.”

Crew members missed significant holidays while deploying in November 2014, but many of them will be returning wearing additional “hardware” on their chests—20 enlisted Sailors and three officers completed their submarine warfar qualifications to earn their silver and gold dolphins.
The FY16 Submarine Commanding Officer/Executive Officer Selection Board Convened on May 18, 2015. The Following Officers were Selected:

**Submarine Commanding Officer**
- Jason D. Anderson
- David P. Brooks
- Andrew M. Cain
- Jason M. Dinkel
- Michael R. Dishie
- John R. Dye
- Robert Stansell

**Submarine Executive Officer**
- C Yong Lee
- Jonathan R. Baugh
- Kevin J. Behm
- Matthew E. Brown
- Michael C. Paisant
- Thomas P. ODonnell
- Terry A. Nemec
- Michael V. McLaine
- James E. Mahoney Jr.
- Steven C. Lawrence

**Commanding Officer (Submarine Support)**
- Brian C. Black
- Scott M. Callen
- Michael F. Dunleavy
- Matthew T. Fournier
- Chad A. Hard
- Anthony J. Harrell
- John M. Kibby
- Joseph G. Lautzenheiser
- Christopher C. Lautzenheiser
- Nathaniel M. Moreau
- Brian W. Mclaughlin
- Robert L. Panchin IV
- Jeremy A. Pelstring
- Derrick R. Peters
- Dorothy P. Peters
- David T. Simmons
- Michael A. Tison
- Samuel C. Mills
- Kyle S. McVay
- Edward J. May Jr.
- Barry E. Mark Jr.
- Kerry M. Major
- Robert A. Low
- Randall J. Leslie
- Seth R. Krueger
- Dustin T. Kraemer

**Executive Officer (Submarine Support)**
- Christian A. Jones
- Todd C. Brown
- Bradley M. Boyd
- James R. Brooks
- Albert F. Calag
- Randolph D. Crow Jr.
- Rodney A. Craigan
- Clayton J. Hughey
- Lewis S. Inns
- Daniel D. Isby
- Justin E. Irwin
- Carl D. Jepson
- Jeffrey A. Kahn
- Travis A. Lawon
- Joe J. Lenrometer
- Alex S. Raffen
- Joshua N. Ragadio
- Brandon L. Rice
- Charles J. Bowers

**MTC Qualified SWMC**
- MTC (SS) Grant Boswell
- USS Ohio (SSBN 726) (B)
- MTC (SS) Gregory Miller
- USS Ohio (SSBN 741) (G)
- MTC (SS) Christopher Riddle
- Strategic Weapons Facility Pacific
- MTC (SS) Kenneth Schmidt
- Strategic Weapons Inspection Det COMSUBPAC
- MTC (SS) Melvin Whaley
- USS Indiana (SSN 774) (G)
USS Cavalla, a Gato-class fleet sub, was launched on November 14, 1943 by Electric Boat Co. in Groton Conn. On February 29, 1944, she was commissioned, with Lt. Cmdr. H.J. Kossler in command. Cavalla departed New London April 11, 1944 and arrived at Pearl Harbor on May 9. En route to her station in the eastern Philippines, she made contact with a large Imperial Japanese Navy (IJN) task force on June 17. Cavalla tracked it for several hours and relayed location and heading information that contributed heavily to the U.S. victory scored in the Battle of the Philippine Sea, (the “Marianas Turkey Shoot”) on June 19-20, 1944. On June 19, she caught the IJN carrier Shokaku landing planes and quickly fired a spread of six torpedoes scoring three hits, sending Shokaku to the bottom. After a severe depth charging by three enemy destroyers, Cavalla escaped to continue her patrol.

Cavalla’s second patrol took her to the Philippine Sea as a member of a wolfpack operating in support of the September 15, 1944 invasion of Peleliu. On November 25, 1944, during her third patrol, Cavalla encountered two IJN destroyers and made a daring surface attack that blew up Shimotsuki. The other destroyer began depth charging, but the elusive Cavalla escaped. Later in the same patrol, on January 5, 1945, she made a night surface attack on an enemy convoy and sank two converted net tenders.

On her fourth and fifth war patrols, Cavalla cruised the South China and Java Seas. Targets were sparse, but she came to the aid of an ally on May 21. A month into her fifth patrol, her crew sighted HMS Terrapin damaged by enemy depth charges and unable to submerge or make full speed. Cavalla escorted the wounded submarine on the surface to Fremantle, arriving May 27, 1945.

While lifeguarding off Japan on her sixth war patrol, Cavalla received the August 15 cease-fire order. A few minutes later she was bombed by a Japanese plane that apparently had not yet received the cease-fire order. She entered Tokyo Bay on August 31 and remained for the signing of the surrender on September 2. She departed the next day for New London, arriving October 6, 1945. She was placed out of commission in reserve there on March 16, 1946.

Cavalla returned to service in 1953 as a hunter-killer submarine (SSK). She was assigned the experimental designation AGSS in 1963. In 1971 she was transferred to the Texas Submarine Veterans of World War II and delivered to her permanent berth where she serves as a memorial to Submariners lost in WWII at Sea Wolf Park, Galveston Texas.

Cavalla received a Presidential Unit Citation and four battle stars for service in WWII. She is credited with sinking 34,180 tons of enemy shipping.