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STRENGTH THROUGH INDUSTRY & TECHNOLOGY

UNDERSEA WARFARE DIVISION

A Message from the Director, Submarine Warfare Division (N87)

RADM CECIL HANEY, USN

"The thing that always struck me about the Navy was the technology, the fact that we were always looking to the future, the fact that the Navy was in the forefront of great developments. And when I came in as the CNO, it was very important to me that we collectively, as a service, and as a department, never lose sight of always looking for the next big thing, always looking ahead, looking to make our capabilities better, more effective, and as warriors, more lethal, than what anyone else can put on the battlefield."

– CNO, 1 February 2008

Greetings from the Pentagon. It is busy here in Washington with three concurrent budget cycles running at full speed but I was especially pleased with the opportunity to provide comments in this newsletter when ADM Mike Sharpe asked me to address the issue of "Understanding and Addressing the Evolving Missions: the Critical Challenge." What an appropriate topic for the complex ever-changing world we live in today. Our nation depends upon our ability to meet and overcome the challenges imposed by not only the current War on Terror but also the full spectrum of emerging peer competitors, developing states, and transnational and non-state entities.

Today, like every day, you will find our Navy executing the maritime strategy in the global commons. Our Submarine Force of 52 SSNs, 14 SSBNs and 4 SSGNs is making a direct impact in defending our nation's interests worldwide. The successes of USS HAWAII (SSN 776) and USS OHIO (SSGN 726) on their maiden deployments are testament to the tremendous synergy that comes from the melding of incredible ships with fantastically talented sailors.

One of the reasons our force has been so successful is largely due to our teamwork with the shipbuilding industry that has worked so diligently over the last 108 years to ensure that we continue to field the most technologically advanced, combat capable submarines in the world. Having recently been to sea on USS VIRGINIA (SSN 774) and USS NORTH CAROLINA (SSN 777) and walked the decks of USS FLORIDA (SSGN 728), I can personally attest to the awesome capabilities of these platforms.

"OUR NATION DEPENDS UPON OUR ABILITY TO MEET AND OVERCOME THE CHALLENGES IMPOSED BY NOT ONLY THE CURRENT WAR ON TERROR BUT ALSO THE FULL SPECTRUM OF EMERGING PEER COMPETITORS, DEVELOPING STATES, AND TRANSNATIONAL AND NON-STATE ENTITIES."

— RADM CECIL HANEY, USN

RADM CECIL HANEY, USN
DIRECTOR, SUBMARINE WARFARE DIVISION (N87)

In my previous role as Commander, Submarine Group TWO, and my current role as Director, Submarine Warfare Division (N87), I am able to see not only the near real time products our force delivers on a daily basis but also the wide-ranging impact that our post-deployment reports receive. From intelligence, surveillance, and reconnaissance to the War on Terror to strategic deterrent patrols, our efforts are recognized and highly regarded. Our role is undeniable across the full spectrum of

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Director's Message (continued from page 1)

operations from forward deployed Phase-0 operations, to direct support of the War on Terror, to major combatant operations.

However, there can be no "rest" as other nations continue to move forward to deliver increasingly credible undersea combat capacity and capability. At N87 we are constantly evaluating, developing and working to facilitate the delivery of technologies that have the potential to provide transformational capability in maintaining our asymmetric advantage. Improvements in communications (at periscope depth and deeper), weapon and sensor capabilities, battlespace management tools, Time Critical Strike, deployment of Unmanned Aerial Sensors (UAS) and C4I currently top the list of potentially revolutionary initiatives. When coupled with efficient and effective human-machine interfaces and improved training regimens, these technologies offer the opportunity to change the playing field as we know it against a whole spectrum of current and emergent threats.

Given the current fiscal environment, and as responsible stewards of our taxpayer investments, we must continue our efforts to refine the acquisition process from cradle to grave with warfighting effects as the focal point. This process must include clear definition of programmatic requirements and increased rigor in controlling costs and schedule. Our ability to better understand the full spectrum of lifecycle costs, investment requirements, and reliability expectations required for new and emerging technologies will ensure a fiscally informed risk balanced approach. Our recent successes with the Virginia Class cost reduction efforts to achieve $2 billion (FY05 dollars) per hull by FY12; the on-time, on-budget delivery of our four SSGNs; and our pioneering Acoustic Rapid COTS Insertion (ARCI) Advanced Processor Build (APB) Technology Insertion (TI) open-architecture program is illustrative of what's possible.

In closing, I am both excited and humbled to be part of today's Navy. As the submarine force's CFO, I will focus my efforts to build on my predecessors' remarkable work and success that provided our nation with credible and capable combat capability. ADM Rickover once remarked, "Good ideas are not adopted automatically. They must be driven into practice with courageous patience." I know that together we are capable of meeting our nation's demands, now and into the future.

Division Chair's Update

MILO HYDE, UNDERSEA WARFARE DIVISION CHAIRMAN

To the Undersea Warfare (USW) community, I thank you for your continued support of the Undersea Warfare Division.

We are in the final stages of planning our Joint Undersea Warfare Technology Spring Conference, 28 April – 1 May 2008, at the Admiral Kidd Conference Center, San Diego, CA. Conference Director Wayne Jakubowski is lining up an excellent slate of speakers and once again technical sessions are full, in fact over subscribed, with quality presentations from industry, Navy program managers, representatives of the Navy's technical community and academia. If you want to understand the Navy's most current plans, programs and technologies and their challenges and threats, you should be at this conference. Once again we look forward to record attendance from the USW community for this outstanding event. I am proud to report that our Fall Conference was an immense success with record attendance, excellent speakers, and sold out technical sessions. I thank Conference Director Paul Normand for his seemingly endless work and attention to production of this quality event. As usual the lobster was excellent!

During the March Executive Board Winter Roundtable meeting we were hosted by ADM John Greenert, Commander Fleet Forces Command, at his headquarters in Norfolk, VA. Back in July 2007, Dennis Jones and I paid a courtesy call to VADM Greenert, then N8, in his Pentagon office. ADM Greenert was a gracious host and spent two hours with us sharing his views on undersea warfare issues facing the fleet. In particular we received an update about legal issues limiting the Navy's use of active sonar in critical training exercises. As members of the Undersea Warfare Community and concerned citizens, I encourage you to become familiar with this issue. Just Google "sonar and whales" for an excellent start. Our community understands better than most the perishability of USW training and its impact on national security.

> "OUR COMMUNITY UNDERSTANDS BETTER THAN MOST THE PERISHABILITY OF UNDERSEA WARFARE TRAINING AND ITS IMPACT ON NATIONAL SECURITY ."
>
> - MILO HYDE, UWD CHAIRMAN

Let me highlight a couple of organizational changes. Our long-term Publications Committee leader Ken Jensen, Raytheon, has recently taken an exciting overseas position and can no longer produce this excellent publication. During the years he has significantly enhanced the professionalism of our glossy. I thank Ken for his service and Raytheon for their sponsorship. Raytheon has signed on to continue sponsorship of the spring and fall publications with new editor Tom Dion of Raytheon. Thanks Tom for stepping up to this important work. Additionally Ron Blue has served three Division Chairman as Roundtable Executive and I regrettably agreed to let him stand down after our last roundtable (he threatened to quit anyway). Under Ron's leadership our division has remained in close contact with the Who's Who of undersea warfare. Thanks to Ron for his service and to Mike Sharp for taking over.

MILO HYDE
UNDERSEA WARFARE DIVISION CHAIRMAN

It is with great regret that I announce the recent passing of our shipmate RDML Charles (Chip) Griffiths, USN (Ret). On behalf of the Undersea Warfare Division I extend our deepest sympathies to Chip's family and thank them for a career of dedication to our nation, the Navy, and the undersea warfare community. We will miss him.

In closing, I thank the USW community for your robust support to the division and encourage you to hang with us as we continue to craft creative solutions to the Navy's USW challenges. I look forward to seeing you in San Diego.

Fall 2007 Bronze Awards

ROBERT KITTREDGE, AWARDS CHAIRMAN

The USW Committee recognized seven technology leaders for their outstanding achievements in Undersea Warfare at the annual Fall Conference held at the Naval Submarine Base at Groton, CT. Annually the Committee recognizes outstanding individual achievements in either science or engineering in the USW field with its Bronze Awards. Awardees at the Fall Conference included: Dr. Robert Ahlers, Dr. Gregory Ames, Dr. Anthony Dandridge, Mr. Gregory S. Harris, Mr. Peter Herstein, Dr Bruce E. Sandman, and Mr. Randy L. Williams.

DR. ROBERT AHLERS
NAVAL AIR WARFARE CENTER, TRAINING SYSTEMS DIVISION

Dr. Robert Ahlers, Naval Air Warfare Center, Training Systems Division, was recognized for his contributions in the areas of training and simulation development for USW applications.

DR. GREGORY AMES
NAVAL UNDERSEA WARFARE CENTER, DIVISION NEWPORT

Dr. Gregory Ames, Naval Undersea Warfare Center, Division Newport, received his award for pioneering work that dominates current research and development of fiber optic sonar systems.

DR. ANTHONY DANDRIDGE
NAVAL RESEARCH LABORATORY

Dr. Anthony Dandridge, Naval Research Laboratory, was awarded for his contributions in the area of fiber optic acoustic sensors development for Undersea Warfare applications which have formed the basis for current and next generation sonar systems for the Navy.

MR. GREGORY S. HARRIS
NAVAL SURFACE WARFARE CENTER, DIVISION INDIAN HEAD

Mr. Gregory S. Harris, Naval Surface Warfare Center, Division Indian Head, was recognized for his work in undersea computation and explosive effect simulation systems throughout the U.S. government, academia and industrial complexes, as well as the international community.

MR. PETER HERSTEIN
NAVAL UNDERSEA WARFARE CENTER, DIVISION NEWPORT

Mr. Peter Herstein, Naval Undersea Warfare Center, Division Newport, received his award for his efforts that provided understanding of the physics of underwater acoustics and his end-to-end knowledge of the principles of sonar systems that lead to key developing improvements to existing anti-submarine warfare systems.

DR. BRUCE E. SANDMAN
NAVAL UNDERSEA WARFARE CENTER, DIVISION NEWPORT

Dr. Bruce E. Sandman, Naval Undersea Warfare Center, Division Newport, accepted his award for achievements in the advancements in mechanical and acoustical aspects of undersea weapons design and development, and other significant contributions in undersea warfare research and development.

MR. RANDY L. WILLIAMS
NAVAL SURFACE WARFARE CENTER, DIVISION PANAMA CITY

Mr. Randy L. Williams, Naval Surface Warfare Center, Division Panama City, was recognized for playing a pivotal role in every development of new technologies for mine sweeping.

FALL 2007 AWARDEES
THE RECIPIENTS ARE ALL LEADERS IN THEIR RESPECTIVE FIELDS FROM VARIOUS NAVAL LABORATORIES

Undersea Vehicles Committee

RICHARD W. TALIPSKY, CHAIRMAN

Unmanned platforms use remains high on the list of systems that act as force multipliers previously requiring people-in-the-loop. The integrated Office of Secretary of Defense Unmanned Systems Roadmap included aircraft, ground and maritime systems. It confirms the central role that unmanned systems will have in supporting the nation's security needs, particularly the Global War on Terrorism. Manned vehicles are undergoing changes providing operational elements supporting National security needs. This includes deployment of the SSGN variant of the Trident Class submarine and potential modifications to attack submarines allowing for a diversity of missions. New technology is developing at an ever-increasing rate and the proven spiral technology insertion methodology is provided to the Fleet in record time. There are many hurdles that require our industrial know-how. High on the list are vehicle endurance and high data rate communications at speed and depth.

> **"THE INTEGRATED OFFICE OF SECRETARY OF DEFENSE UNMANNED SYSTEMS ROADMAP...CONFIRMS THE CENTRAL ROLE THAT UNMANNED SYSTEMS WILL HAVE IN SUPPORTING THE NATION'S SECURITY NEEDS, PARTICULARLY THE GLOBAL WAR ON TERRORISM."**
>
> **- RICHARD W. TALIPSKY, CHAIRMAN**

Unmanned Undersea Vehicles (UUVs)

AN/BLQ-11, Long-Range Mine Reconnaissance System

After over ten years of design, prototyping, development, and at-sea testing, a team of engineers and technicians from Boeing and the Naval Undersea Warfare Center (NUWC), Division Newport, and operators from Commander, Submarine Development Squadron Five (CSDS-5) successfully demonstrated autonomous UUV retrieval back into an SSN using a robotic arm aboard USS HARTFORD (SSN 768) in October 2007. The AN/BLQ-11 is sponsored by the Navy's Unmanned Maritime Vehicle System Program Office, PEO-LMW PMS403. The AN/BLQ-11, a system designed to detect mines in littoral waters, includes two UUVs that were impulse launched from an SSN torpedo tube and operated autonomously from the SSN. During two test events at the Atlantic Undersea Test and Evaluation Center (AUTEC), each UUV was able to operate independently from the host SSN until commanded to home and dock. The recovery arm, the centerpiece of the demonstration and the focus of critical test objectives, successfully captured, towed and retrieved each UUV back into the torpedo tube for backhaul, data downloading, and refurbishment.

Mk30 Mod2 ASW Training Target System

The ASW Training Target System Mk30 Mod2 production contract was awarded in FY05 to the Lockheed Martin Sippican/Granite State Manufacturing Submarine Antenna Joint Venture, LLC (JV) for 11 targets. The first four of those targets have completed System Level Testing, Factory Acceptance Testing, and in-water acceptance testing at NUWC, Division Keyport. In FY07, the NAVSEA Undersea Weapons Program Manager (PMS-404) established a transition to operation team consisting of members from the JV, PMS-404, NUWC, Divisions Newport and Keyport, NUWC Detachment Pacific, and the ASW Targets Single Point Manager (SPM). The team was charged with the task of transitioning the Mk30 Mod2 production targets to fleet operations at Hawaii. The transition team reviewed all aspects of Mk30 Mod2 production and determined that it is beneficial for both the Navy and the Mk30 program to initiate the transition of Mk30 Mod2 targets to the Hawaii Mk30 Operational Site at the Pacific Missile Range Facility (PMRF) with the four production targets and one pre-production target.

All Mk30 Mod2 equipment currently at NUWC, Division Keyport will be shipped to PMRF in support of efforts required to establish and certify the Hawaii Mk30 Operational Site (OPSITE) for Mk30 Mod2 operations. Certification will be accomplished in two phases. Phase 1 will re-introduce Mk30 Mod2 systems at PMRF site. During this phase, Mk30 Mod2 experts from NUWC Newport and Keyport, and the JV will be on-site and will be responsible for all Mk30 Mod2 efforts. Phase 1 will include set-up and check out of all Mk30 Mod2 equipment, training for all OPSITE personnel, completion of operational software modifications, and completion of a series of engineering runs. Phase 2 will assess OPSITE readiness to support fleet operations. The OPSITE will be required to successfully complete the standard Mk30 certification process (PMS-

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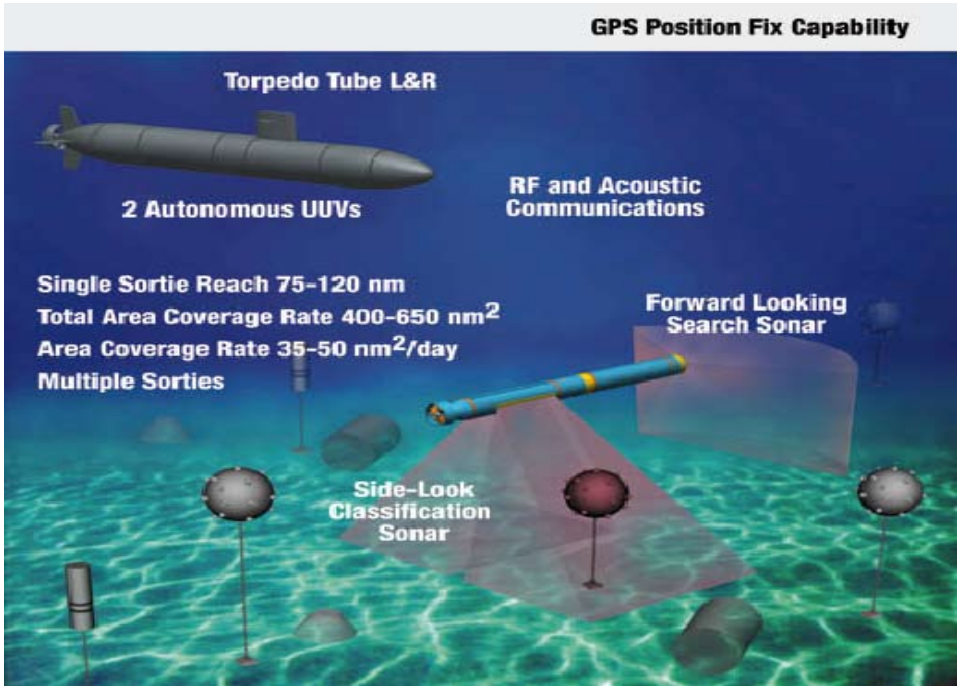

Undersea Vehicles Committee (continued from page 4)

404 approved) prior to providing Mk30 Mod2 targets for fleet missions. Upon certification, the OPSITE will be responsible for all Mk30 Mod2 operational efforts. Transition to operation is scheduled to be completed in third quarter FY08. At that time, both Mk30 Mod1 and Mk30 Mod2 targets will support fleet ASW training missions. Upon acceptance of the remaining Mk30 Mod2 production targets, the OPSITE will become primarily a Mk30 Mod2 facility with Mk30 Mod1 targets only utilized to support off-range missions.

ABOVE: MK30 MOD2 ASW TRAINING TARGET PREPARING FOR LAUNCH

Unmanned Surface Vehicles (USVs)

Commercial-off-the-shelf application versatility was demonstrated in September 2007 when a USV performed a successful remote launch of not only a Mk54 Recoverable Exercise Torpedo (REXTORP) and a Mk46 torpedo shape but also three sonobuoys, an Expendable Mobile ASW Training Target (EMATT) and a small Unmanned Air Vehicle (UAV) shape from a single USV all using automotive airbag inflator impulse technology. This was a proof of concept demonstration for a future Littoral Combat Ship (LCS) Mission Module.

Weapons and Countermeasure Launchers

Virginia Class Submarine Breech Extension Guide Diver Platform

The Breech Extension Guide (BEG) Diver Platform was developed to ease loading and handling (L&H) of External Countermeasure Launcher (ECL) modules onboard the Virginia Class submarine. Traditional L&H operations required the installation of a large platform and walkway on the submarine's hull. This timely evolution required numerous crane operations with diver assistance for placement and securing of the platform and walkway. By designing and implementing a smaller diver platform, which has become integral to the BEG, the time and effort required for L&H has been significantly reduced. Additionally, the smaller diver platform eliminated the need of the more costly platform, walkway, stands, and brackets. In addition to the diver platform, a transportation stand was also designed to stow and transport the BEG in the vertical position. This greatly eased BEG handling and eliminated rigging/crane operations for righting the BEG for use.

ABOVE RIGHT: TRADITIONAL L&H HARDWARE DESIGN (NOTE EXTENSIVE STAGING AND RIGGING)
ABOVE LEFT AND BOTTOM: NEW BEG DIVER PLATFORM DESIGN (DEMONSTRATING EASE OF OPERATION, HANDLING AND TRANSPORTATION)

Torpedoes

Advanced Sonar Development

The proliferation of quiet diesel submarines, the advancement of acoustic countermeasures and the reverberation limited confines of shallow water have made Anti-Submarine Warfare (ASW) extremely difficult even for most modern torpedoes. While efforts are being made in the signal processing algorithms to extracting the last decibels of detection and classification clues from the sonar returns, Office of Naval Research (ONR) and the Navy are investing in a new sonar array that will provide a step increase in torpedo performance. The new array, which is slated for its first introduction into the Mk54 lightweight torpedo, provides wideband sonar performance using 112 doubly resonant transducers.

Currently, baseline sonar arrays for both the Mk54 and the Mk48 heavyweight torpedoes have 52 narrowband transducers. In addition to the array, the receiver and transmitter electronics are being redesigned to take advantage of wideband waveforms and algorithms currently under research. The Mk54 wideband array program, dubbed Technical Insertion No. 1, recently completed a successful Preliminary Design Review. Critical Design Review is scheduled for July 2008 and the program is scheduled to be in full rate production in FY11. The technology is in the early stages of development with a scaled up 112-element array being developed for a demonstration vehicle and its own Technical Insertion plan expected to be in production in FY15.

Mine Warfare Committee

ERIC HOLMES, CHAIRMAN

The Mine Warfare (MIW) Committee will have an exciting and informative session at the Joint USW Spring Conference in San Diego, and not just from the excellent selection of presentations, but for the opportunity to dialogue on current issues and discuss the Underwater Improvised Explosive Devices (U-IED) study that was initiated late last year. In addition to the technical sessions, we will hold a committee meeting during the Wednesday working lunch (box lunches will be available). We urge all committee members and other interested parties to participate in discussions about U-IED study objectives and construct, the progress to date, and how you can participate.

Late last year, NDIA was tasked by the Naval Mine and ASW Warfare Command (NMAWC) to study methods and techniques for the defeat of U-IEDs in port and harbor environments. This study, the responsibility of the MIW Committee, was formally kicked off with a large group of participants (more than 100) 15 January 2008. It is currently scheduled for completion in late 2008. The study consists of three phases: assessment of current capabilities (to include multi-agency strategy, policy and command-and-control relationships and projected terrorist threat); exploration of alternative applications of technology; and conclusions and recommendations. We have recently established working groups (WG) aligned with these phases and plan to begin the first two WG efforts prior to the Spring conference. Interest and participation external to the NDIA has been high and includes NMAWC, USCG, NORTHCOM, Naval Post-graduate School, and N852.

The study's impetus, as outlined in the U-IED Study Terms of Reference (TOR), is potential terrorist operations disrupting shipborne commerce with the specific intent of inflicting damage to the United States economy. More than 90 percent of American exports and imports by volume transit U.S. ports, with economic consequences of U-IEDS in our ports potentially catastrophic. This disruption would have a significant impact on the economic health of the nation, as it could be expected to extend past several weeks causing many billions of dollars in economic loss. Currently, the extent of this threat is not fully understood nor is the capability to effectively address the threat with either current or future capabilities. The study is intended to fully explore that threat and investigate our capability to respond with conventional or unconventional resources, as required. Working Group 1 will explore the bureaucracy, Working Group 2 will evaluate current capabilities, Working Group 3 will use the results to identify capability gaps, and Working Group 4 will investigate the use of conventional and unconventional assets to address those capability gaps. The study should be fun and rewarding for participants. If you would like to participate, contact Bill Key (william.key@wktechgroup.com), the MIW committee deputy chairman, or myself (eric.holmes@lmco.com). We will be happy to fit you into the working group that best suits your personal experience, capabilities, and goals.

> **"MORE THAN 90 PERCENT OF AMERICAN EXPORTS AND IMPORTS BY VOLUME TRANSIT U.S. PORTS, WITH ECONOMIC CONSEQUENCES OF U-IEDS IN OUR PORTS POTENTIALLY CATASTROPHIC"**
>
> **- ERIC HOLMES, CHAIRMAN**

As for more traditional MIW interests, the organic MIW programs continue to transition from development to production. The AN/WLD-1 Remote Minehunting System (RMS), AN/AQS-20A Sonar Mine Detecting Set, Airborne Laser Mine Detection System (ALMDS) and Airborne Mine Neutralization System (AMNS) are all in Low Rate Initial Production (LRIP) in support of the LCS mission modules. AMNS just passed Milestone C, with picture highlights shown to the right.

The Coastal Battlefield Reconnaissance and Analysis (COBRA) system is planned to achieve Milestone C this summer. Each of the organic MIW systems have critical connections to their delivery platforms, including the MH-60S, Firescout and Unmanned Surface Vehicles (USVs), with their development also critical to the successful implementation of the MIW systems, as we see as the LCS MIW mission package comes to fruition. In addition to these programs of record, the Office of Naval Research (ONR) is transitioning efforts from science and technology (S&T) to PEO LMW-led programs. These include the Advanced Computer Aided Detection/Computer Aided Classification (CAD/CAC) S&T results to be implemented in the AN/AQS-20A processing and the Unmanned Surface Sweep System (USSV), transitioning an acoustic and magnetic sweep capability using an 11-m USV.

Improvements in MIW are not solely attached to MIW mission package on the LCS. As reported in the Fall newsletter, the dedicated MIW forces, represented by the MCM (Avenger) class ships, continue to be modernized. A program has been initiated to bring more capable mine neutralization to the MCM class ships with the October 2007 award of the Expendable Mine Neutralization System (EMNS) contract. The EMNS will use the same common neutralizer that the AMNS program is using and is also likely to be adapted for a shallow water mine neutralization capability.

Clearly organic MCM systems are showing great promise in getting the man out of the minefield. The MCM challenge is now extended to accelerating the detect-to-engage (DTE) time line, someday possibly achieving in-stride DTE operations. Command, control and communications improvements will be critical to achieving this goal; including multi-

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C4I/Combat Systems Committee

MICHAEL A. TUCKER, CHAIRMAN

The committee is pleased to report an outstanding turnout of papers for the Spring conference, with a wide representation from government, academia and industry. The presentations offer a mix of programs, test results and technology that will provide insight and stimulate the exchange of information.

I am sad to report that Deputy Chair Jim Thompson will be stepping down and moving to the Undersea Division advisory council. Jim has been an enthusiastic supporter and major contributor to this committee for more than 12 years; first as liaison officer and then as deputy chair. He will be greatly missed.

I am pleased to report that CAPT Paul Rosbolt, USN (Ret), will be taking over as deputy chair. Paul has been very involved with NDIA and in particular with this committee having formerly served as liaison officer. CAPT Rosbolt has been a strong and visible supporter of NDIA. We look forward to having Paul onboard.

FIGURE 1: SELF-ORGANIZING NETWORKS IN SUPPORT OF ASW COMMAND AND CONTROL

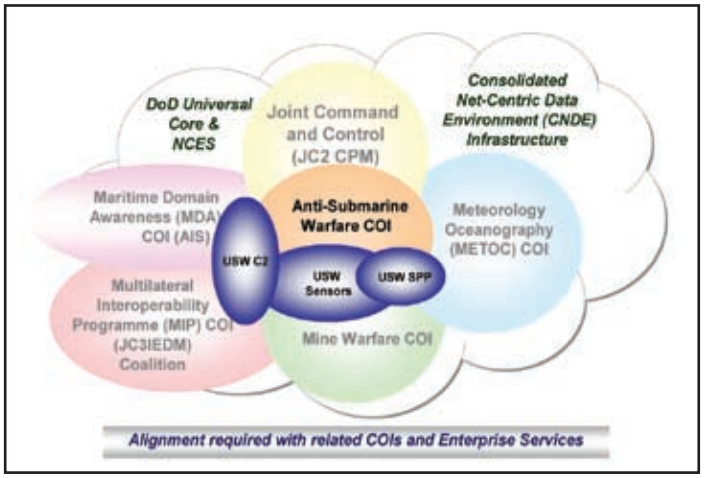

FIGURE 2: DOD AND COALITION DATA ENVIRONMENT

> "ONE OF THE GREAT CHALLENGES OF DEVELOPING NET-CENTRIC CAPABILITY FOR THE ASW COMMUNITY OF INTEREST (COI) IS TO DEVELOP A COMMON UNDERSTANDING OF TERMINOLOGY AND CONTEXT ACROSS THE COMMUNITY AND WITH OUR COALITION PARTNERS."
>
> - MICHAEL A. TUCKER, CHAIRMAN

The landscape related to the development of an ASW Common Tactical Picture (CTP) has changed significantly during the last 18 months. Major changes are taking place with the Departments of Homeland Security, Justice, Defense and the Intelligence Community working together on common data elements called the Universal Core. We are also seeing a renewed emphasis on Naval Open Architecture (OA) as the OA Lead Council, composed of key flag level acquisition officials, met for the first time last month. During that meeting the committee took a number of government and industry briefs addressing concepts, technologies and strategies for the development of an ASW Common Tactical Picture in areas of common tactical picture, communications and data strategy.

The USW Decision Support System (USW-DSS), the primary ASW Command and Control (C2) system, is being fielded, is operational and is providing the Navy with improved C2 capability. USW-DSS is one of the leading defense systems in implementing service oriented and the Navy CANES architectures. As part of the ASW Common Tactical Picture Study, we have completed a communication study and anticipate an outbrief will be completed this spring. The study has indentified the need for non-satellite linked Over-The Horizon communications, bandwidth and network management tools, and self-organizing networks in support of ASW/C2. Figure 1 gives you an idea of the scope of the requirement.

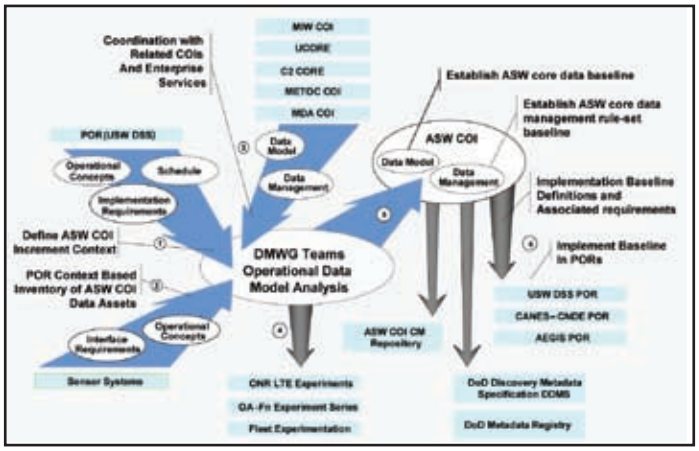

FIGURE 3: ASW COI DMWG PROCESS

Concerning data strategy, one of the great challenges of developing net-centric capability for the ASW community of interest is to develop a common understanding of terminology and context across the community and with our coalition partners. This includes the ability to find where ASW related data is located across the network. DoD has spent considerable effort in this area, mandating

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Mine Warfare Committee (continued from page 6)

vehicle control, battlespace management, and real-time processing. The System of Systems CONOPS for the operational employment of these MCM systems and an MCM Open Architecture approach being pursued by PEO LMW PMS495 should provide the avenue to pursue these goals.

The Naval Mine Warfare Caucus hosted a Capitol Hill reception for the Congressional Naval Mine Warfare Caucus (CNMWC) on 28 January 2008. The attendance was impressive with more than 160 from Congress, government, industry, academia and the armed services, Navy and Marine Corps, in attendance, demonstrating the continued support for Naval Mine Warfare. There is a promising move to reinstitute the CNMWC Senior Advisory Group, which consists of mine warfare community leaders that help focus the CNMWC members each year on our mine warfare objectives for the Congress.

In closing, the Mine Warfare Committee has been re-energized during the past year and a half with greater participation at both the Fall and Spring conferences, the addition of a full session at the clambake, and the initiation of a U-IED study. For each conference, there are more abstracts to select from and the quality keeps improving. This year we unfortunately had to reject over one-third of the submitted abstracts for the Spring conference due to the limited number of presentations permitted at each session. Participation at the committee meeting during the conference is a valuable opportunity to get your views out in the open and discuss MIW (and U-IED) items of interest. This level of interest is valuable to each of us and to the MIW community; let's keep it going.

Undersea Warfare Sensors Committee

JOSE RIO, CHAIRMAN

Present world challenges are forcing a transformation in the way naval military operations are carried out. Our theme, **Understanding and Addressing the Evolving Missions: The Critical Challenges**, underscores this fact. It is imperative that we have a good understanding of our missions to exploit our advanced technology to address the critical challenges. Moreover, our experience with sensing systems throughout the Cold War has sharpened the underlying know-how that applies the technology to ocean physics and provides unmatched performance.

The present emphasis has dramatically shifted and the ability to provide pervasive and interconnected sensing capability with very short reaction times and at great distances to locations that will not be supported with sympathetic infrastructure is the rule rather than the exception. Our ability to adapt will determine how successful we are at evolving our missions to counter an ever changing threat. Our sensing capabilities are a key ingredient needed to counter a threat that has access to modern technology and has the ability to successfully apply that technology through improvisation. Our primary advantage is in large part due to the technological superiority we enjoy. In the undersea arena this technology is heavily exploited in our sensing systems, be they acoustic, electromagnetic, magnetic, chemical or optical.

Deployment and affordability are key factors that must also be considered here. Distributed fields must be quickly deployed where they are needed and at a cost within the affordable range and all of this must be coordinated so that maintenance or refreshment is consistent with the operational need. Covert or clandestine deployment issues must be woven into the overall strategy and the joint force of Navy laboratories, academia and industry are the team needed to make this a reality.

"... THE ABILITY TO PROVIDE PERVASIVE AND INTERCONNECTED SENSING CAPABILITY WITH VERY SHORT REACTION TIMES AND AT GREAT DISTANCES TO LOCATIONS THAT WILL NOT BE SUPPORTED WITH SYMPATHETIC INFRASTRUCTURE IS THE RULE RATHER THAN THE EXCEPTION."

- JOSE RIO, CHAIRMAN

At the end our sensing technology and mature algorithmic know-how will blend the extant military platforms – surface ships, submarines, and dippers – with distributed sensing fields to ensure our capability to protect our forces and to project power effectively anywhere on the globe.

The set of presentations that we have assembled for our technical session broadly cover all areas of interest in sensing systems. There are program perspectives where the respective program executive offices give their outlook about Navy requirements and improvement programs, a number of presentations on mission packages and their evolution to multi-mission platforms, as well as presentations on distributed sensing systems. In addition there is the technology focus with underwater optical communications and optical sensing, an update on the large aperture bow array, an update on the non-penetrating mast, and much more.

As in the past I want to thank Juergen Keil for organizing the agenda and providing excellent support. We acknowledge the support of our USW Sensors Liaison CAPT R. Nicklas, USN. I also want to thank CAPT Bruce Roulstone, USN (Ret), and Kim Williams for providing significant support organizing the split sessions for USW Sensors.

As part of our program this spring we have initiated an effort to revitalize the USW Sensors committee and encourage participation. Mr. Thomas Casey and Mr. Gordon Skadberg of Lockheed Martin have provided invaluable support in their effort and our sincere thanks are extended to them for their enthusiastic support.

C4I/Combat Systems Committee (continued from page 7)

and providing guidance for what they call the net-centric data strategy. The ASW COI has established a Data Management Working Group (DMWG) to develop the necessary tools and products to support unique ASW extensions for the DoD effort. Ensuring there is no duplication of activities with other COIs is difficult and requires close collaboration with numerous organizations. Figure 2 (shown on page 7) highlights the complexity of these organizational overlaps.

The DMWG will develop pilot data demonstration programs (Figure 3 shown on page 7) for ASW Command and Control (C2), Sensors and Sensor Performance Prediction (SPP). The initial focus will be on C2 with a USW-DSS limited technical experiment working with the newly chartered, JFCOM led, Joint Command and Control Capability Portfolio Management (JC2 CPM) process as the designated coordinator and oversight for C2 data strategies within DoD.

Following the communications outbrief, the next phase of our ASW CTP study effort will focus on data strategy and the integration of ASW information and knowledge across these various communities of interest and information domains.

More than 20 representatives from government, academia and industry are currently or have been involved in the ASW CTP study. While Jim Thompson has stepped down as deputy chair, he will continue to lead the study until Dr. Bob Zarnich comes up to speed later in the year. If you are interested in participating in the study, I can be reached at michael.tucker@edocorp.com.

A committee meeting will be held on 28 April 2008 at the Hyatt Regency Mission Bay at 1330. The agenda includes current committee activities and an update about the study.

Aviation Undersea Warfare Committee

DAVID NELSON, CHAIRMAN

The CNO recently conducted an interview with *Defense Daily* that was highlighted by a need for the Navy to expand its investment in the "kill chain" to include more focus on intelligence, surveillance and reconnaissance. With that comment as a lead in this newsletter, we will "follow the money" with a cursory review of the aviation investments recommended in the President's budget for FY09. It is evident that the near term sustainment of core aviation programs such as the H-60 and P-3C continues to dominate the investment accounts. Clearly the investment in the P-3 re-winging is the number one unfunded issue in the FY09 budget submission to maintain the force approach to ASW. This investment in long range maritime patrol capability is critical until the arrival of the P-8A.

"THE CNO ... INTERVIEW ... WAS HIGHLIGHTED BY A NEED FOR THE NAVY TO EXPAND ITS INVESTMENT IN THE "KILL CHAIN" TO INCLUDE MORE FOCUS ON INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE."

- DAVID NELSON, CHAIRMAN

The CNO was also adamant about a role for unmanned aerial platforms in USW. He continued to focus on an unmanned platform that could become a relay for data from distributed arrays as the way to go. That concept will be enhanced with the award this year of the Broad Area Maritime Surveillance (BAMS) system that will provide a loitering high-endurance vehicle as an adjunct to the P-3C/P-8A to enhance the ISR end of the kill chain. Along with BAMS, the Navy is providing a persistent ISR capability with other unmanned aerial vehicles such as Vertical Take Off and Landing Tactical UAV (VTUAV) which will operate from future surface platforms such as the Littoral Combat Ship.

A quick analysis of the FY09 President's Budget Request shows that the Navy's aviation recapitalization plan is moving along at a rapid pace. Thirty-one additional MH-60Rs were added to the budget to bring the total to 226 through 2013. The 60Rs remain part of the multi-year procurement of the common cockpit with the 60Ss. Rs will have numerous improvements to include Airborne Low Frequency Sonar. While the transformational P-8A Multi-mission Maritime Aircraft (MMA) procurement remained at 108 aircraft through the program of record, more than $1.1 billion was requested in the FY09 RDT&E budget to meet its IOC objective of 2013. In the interim, the venerable P-3 program remains a priority of the Navy and continues its ASW improvement program to ensure that it remains tactically relevant and FORCEnet able.

T-1 BEING LOWERED IN THE "JIG" ON 31 MARCH 2008 IN RENTON, WA TO BEGIN FINAL ASSEMBLY

Although not directly related to the platform side of the USW investments, the Consolidated Afloat Networks and Enterprise Services (CANES) is mentioned in the budget highlights as providing a reliable, high-speed Sensitive Compartmented Information (SCI), SECRET and UNCLAS data exchange. The FY09 budget provides for the initial RDT&E funding for CANES which can only make the connectivity between USW units and commanders all the more effective.

Once again, the Aviation USW technical session has an excellent mix of platform and sensors program status overviews along with both acoustic and non-acoustic sensor technology presentations. We look forward to your participation.

Spring Undersea Warfare Division Conference 28 April – 1 May 2008

WAYNE JAKUBOWSKI, SPRING CONFERENCE CHAIRMAN

Building on last year's Fall Conference Clambake, our 2008 Spring Conference, with the theme **Understanding and Addressing the Evolving Missions: The Critical Challenges** is set to further investigate and discuss the path forward for undersea warfare. With a world backdrop requiring 42 percent and 59 percent of our respective surface and submarine forces to be deployed, our current maritime strategy is focused on effectively covering the 70 percent of the earth covered by water. In addition to cooperation among all maritime services, this new strategy adds missions of Maritime Security and Disaster Relief/Humanitarian Assistance. Certainly core capabilities of forward presence, deterrence, sea control, and power projection are fully integrated and remain central for protecting and defending our nation.

The Chief of Naval Operations (CNO), ADM Gary Roughead's advocacy of a balanced 313-ship Navy that adjudicates quantity and capability mix is central to building tomorrow's Navy. This numerical floor provides global capabilities and the mission reach vital to our forward presence requirements. This, combined with technical overmatch when compared to our potential adversaries, is essential. ADM Roughead, at this year's Surface Navy Association Symposium, called for frank dialogue with industry and a continued commitment to cost reduction and improved quality. It is with this purpose that our 2008 spring conference convenes.

> "THIS NUMERICAL FLOOR ... COMBINED WITH "TECHNICAL OVERMATCH" WHEN COMPARED TO OUR POTENTIAL ADVERSARIES, IS ESSENTIAL"
>
> - WAYNE JAKUBOWSKI, CHAIRMAN

We have invited an exciting and diverse group of key military and civilian speakers to lay the foundation at the plenary session as a lead in to the technical sessions which follow. The conference kicks-off on 28 April with a welcome reception, and concludes on 1 May, at the Admiral Kidd Conference Center, San Diego, CA. The Admiral Kidd Conference Center has the significant benefit of easy access to all technical sessions to their co-location within the same building.

This year's classified (SECRET) conference will include technical tracts such as: Aviation USW, C4I and Combat Systems, Mine Warfare, Undersea Sensors, and Undersea Vehicles. A strong group of papers will be presented for each technical committee area and the results of key NDIA projects will be addressed. Sessions will be rounded out by a state of the division for NDIA's Undersea Warfare area, and an award ceremony that will recognize this year's individual award recipients, recognizing key contributions to Undersea Warfare.

NAVAL BASE PT. LOMA, NAVAL MINE AND ASW WARFARE COMMAND COMPOUND

As for logistics, buses will transport conference personnel from the Hyatt Regency Islandia to the Admiral Kidd Conference Center each day of the conference and dress for attendees is business casual (slacks and collared shirts) for industry and khaki for military. Casual attire is appropriate for this year's continued signature Mongolian barbecue to be held on Wednesday evening, 30 April, at the Hyatt.

We look forward to a professionally rewarding conference and enjoyable Mongolian barbecue!

Raytheon Integrated Defense Systems

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