

NATIONAL DEFENSE INDUSTRIAL ASSOCIATION

STRENGTH THROUGH INDUSTRY & TECHNOLOGY

UNDERSEA WARFARE DIVISION



A Message From Commander, Naval Mine and Anti-Submarine Warfare Command

RADM FRANK M. DRENNAN, USN, COMMANDER, NAVAL MINE AND ANTI-SUBMARINE WARFARE COMMAND



I am pleased to have the opportunity to provide the introduction to NDIA's Spring 2009 Newsletter, an opportunity that coincides with the completion of my first year in command of the Naval Mine and ASW Command (NMAWC). Throughout my first year I have enjoyed a strong and valuable association with NDIA and its members and I look forward to continuing that association in the future. It is encouraging to know that we have a strong industry team, as represented by NDIA, supporting the Navy's efforts to achieve dominance in Anti-Submarine (ASW) and Mine Warfare (MIW).

Operational experience, including that gained in several major wars, has taught us that the adversary's ability to exploit undersea concealment represents one of the greatest

threats to our ability to exert control over strategic sea lines of communication and to promote military and economic stability. That experience also has taught us that maintaining a robust and dominant capability in ASW and MIW is, and will continue to be, essential to giving our maritime forces the freedom of maneuver and freedom of access necessary for Joint and multinational campaigns where control of the seas is vital to campaign success.

Today, it's clear from the capabilities they are fielding that an increasing number of potential adversaries have, as well, learned key lessons of undersea concealment and see it as a path to advantage over U.S. forces. The challenges facing our ASW and MIW capabilities are as great today as they have ever been coming from an undersea threat that is growing in size, stealth, speed, endurance, lethality, and operational proficiency.

In order to maintain our dominance over this significant and evolving undersea threat we must constantly evolve our capabilities and introduce innovative new ones. In the future, our ASW and MIW capabilities will have to be effective in environments where detection opportunities are intermittent and brief. We'll need to leverage technologies that enhance

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the probability of detection, reduce the probability of incorrect classification, and rapidly gather valuable information from large amounts of sensor data.

Compressed mission timelines and brief detection opportunities have converged to turn modern undersea threats into time-critical targets. To be successful in the future we will need capabilities for rapid dissemination

of accurate information and those that support improved speed of decision. We'll need common and unambiguous views that yield unprecedented operational and tactical situational awareness and highly detailed knowledge of the undersea environment. Enhanced situational awareness must be

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Division Chair's Update

BRUCE SPEAR, UNDERSEA WARFARE DIVISION CHAIRMAN



One year ago, the key note article in our 2008 spring newsletter was provided by RADM Cecil Haney, Director Submarine Warfare Division (N87).

He began the article with a quote from the CNO: "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." – CNO, 1 February 2008

Our theme for this year's spring conference is "USW Technology, Training and Tactics Supporting Forward Presence, Deterrence, Sea Control and Power Projection." In this year's spring conference we are examining technology exploitation to maximize mission performance. As the theme suggests it is the integration of technology with training and tactics that provides warfare superiority. Our theme relates directly to the vision of our CNO, ADM Gary Roughhead, for future Navy missions.

Your attendance at the conference will provide you with a greater appreciation of the complex-

ities of Undersea Warfare and the importance of a team approach for conducting successful Undersea Warfare missions.

It is up to us, the members of the Undersea Warfare community, to lead the charge on insuring that our fighting forces have the superior equipment, training and tactics to overwhelmingly win any future conflict that depends upon the successful execution of Undersea Warfare.

A provision in our bylaws requires that I present a "state of the division" report at each spring conference. I am providing that report here. The 2008 year was very successful for the Undersea Warfare Division. Thanks to our conference chairmen, Wayne Jakubowski and Paul Normand, we enjoyed outstanding spring and fall conferences. Our technical committee chairmen provided excellent sessions at both conferences with more than 100 technical presentations made at each conference.

Our technical committees also conducted a number of technical studies requested by Navy leadership including: "Communications Management in Support of Anti-Submarine Warfare Common Tactical Picture" for Director Cross Function Board, OPNAV N87; "Underwater IED Study" for NMAWC; and "State of the Practice in Unmanned Systems Study" for PMS 403.

The division presented three \$6,000 scholarships for the 2008–2009 academic year to graduate students involved in Undersea Warfare related studies: Cara Hotchkin at The Pennsylvania State University; David Wick at the University of Texas; and David Dall'Osto at the University of Washington. We presented a number of achievement awards including: The Martel-Bushnell award to Dr. Art Baggeroer; the VADM Weakley award to VADM J. Guy Reynolds, USN (Ret); the CAPT Ringenburg award to Ted Hack; and an award for academic achievement at the Naval Post Graduate School to LT Michael Dolbec. We also presented six technical achievement awards to engineers and scientists from government and academic research laboratories.

I look forward to another outstanding year for the Undersea Warfare Division in 2009. I am sure with the excellent leadership provided by the Division Executive Board and Advisory

"... it is the integration of technology with training and tactics that provides warfare superiority."

Council and the support of all of you who believe in the importance of a superior Undersea Warfare Capability we shall surely succeed.

A Message from Commander, Naval Mine and Anti-Submarine Warfare Command

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accompanied by robust decision support and knowledge management tools that greatly increase the speed and effectiveness of decisions by commanders within the ASW team.

Increasingly, our ASW and MIW capability will need to be effective in places where air and surface superiority has yet to be achieved and in circumstances where concurrent demands on multi-mission platforms reduce the capacity available to ASW and MIW commanders. These are situations in which unmanned and distributed capabilities hold promise. In the future, the undersea battlespace will be successfully shaped by the balanced contributions of manned platforms and unmanned vehicles with their sensors and weapons fully networked for common undersea effects.

Highly trained and proficient operators will, for the foreseeable future, be the linchpin of our dominance in ASW and MIW. As well as for new capabilities, we will need to leverage technologies that enable us to better train our operators and maintain their proficiency at very high levels in these challenging mission areas. A number of constraints and limitations on at-sea training as well as the need to train in complex scenarios that are difficult to create in live events will make training using simulation critical in the future. The most important characteristic of that simulation is the degree to which it replicates what our operators will experience in actual environments.

In the 20th century, ASW and MIW were addressed as distinct entities, driving capability and associated capacity in specific directions. With the advent of capabilities such as mobile mines and unmanned underwater vehicles the

distinction between these warfare areas is blurring. In the 21st century the evolving undersea threats might be better approached in a common undersea context – USW – employing more innovative solutions. NMAWC is in a unique position to facilitate this common approach and will continue to build bridges between organizations that traditionally focused exclusively on ASW or MIW.

In closing, I am excited to play a role in the Navy's efforts to sustain dominance in USW. The Navy has a history of rising to the challenges of the undersea threat and I'm confident we will continue to do so in the future. I look forward to working together with our vital partners in NDIA to meet these challenges.

Undersea Warfare Division Honors Awardees

BOB KITTREDGE, AWARDS CHAIRMAN



The Spring 2008 Weakley Award and the Fall 2008 Undersea Warfare Division Bronze Awards

THE VICE ADMIRAL CHARLES E. WEAKLEY AWARD



is presented for meritorious service and/or noteworthy contributions to effective government and Industry communications in the field of Undersea Warfare (USW).

The spring 2008 Vice Admiral Weakley Award was presented to **VADM J. Guy Reynolds, USN (Ret), President Naval Submarine League**, who was unable to be in attendance at the spring conference to accept. His formal presentation was conducted

during the fall clambake. During a career spanning more than five decades, VADM J. Guy Reynolds has distinguished himself as a visionary leader and a consummate technical expert with a unique ability to forge cooperative working relationships across institutional bounds. As an active duty officer, VADM Reynolds tirelessly championed undersea warfare technology from science and technology to research and development, production and in-service improvement, becoming the "Father of ADCAP" and moving submarine combat systems into the digital age with BSY-1 and BSY-2. After retiring, VADM Reynolds has continued to foster government-industry communications as President of the Naval Submarine League, and as a consultant to numerous companies involved in undersea warfare. In all endeavors, he possesses an unparalleled ability to communicate with personnel at all levels, from Admirals to Ensigns, and from CEOs to shipyard workers, which has helped ensure that the Navy acquires the most effective and efficient capabilities for today and tomorrow.

THE NDIA BRONZE AWARD *is issued to recognize outstanding individual achievements in either Science or Engineering in the field of Undersea Warfare by awarding Bronze Medals to key individuals in the principal Navy and University Laboratories engaged in Undersea Warfare related activities. By recognizing these individual achievements, the Undersea Warfare Division seeks to: reward achievement in the field of Undersea Warfare; inspire accomplishments by other workers in the field; and to increase public awareness of the field and its importance to defense preparedness. The Undersea Warfare Division was pleased to present five of its Bronze Medal Awards during the Plenary Session of the Fall 2008 USW Conference in New London, CT. The Bronze Medal Award winners for 2008 are:*



Dr. Russell Burkhardt, The Applied Research Laboratory of The Pennsylvania State University: Dr. Burkhardt's contributions to submarine and surface ship undersea warfare programs, specifically torpedo defense, and the development of the Anti-Torpedo Torpedo, are providing the transition of critical technology to the fleet. His continued technical leadership on programs and guidance

in educating future research and development engineers will ensure the transition of invaluable knowledge, experience, and technology to the fleet in the future. Throughout his career at The Applied Research Laboratory at The Pennsylvania State University, and 29 years working in Undersea Warfare, Dr. Burkhardt's accomplishments in the advancement of sonar and signal processing have directly contributed to the continued undersea superiority enjoyed by our U.S. Navy.



Mr. Kyrill Korolenko, Naval Undersea Warfare Center, Division Newport: Mr. Korolenko's contributions in the areas of sensor and antisubmarine warfare technology are directly reflected in the design of numerous surveillance and tactical sonar systems in operation in the Navy today. His achievements are broadly manifest in both passive and active sonars, including the surface combatant

AN/SQQ-89 systems, the Multi-Function Towed Array and the Distant Thunder Multistatic Sonar systems. Mr. Korolenko was a prime mover in transitioning technologies into systems incorporating Commercial-Off-The-Shelf (COTS) technology. The Active Sonar Performance Realization (ASPR) program transitioned to AN/SQS-53D and the Macintosh Digital Signal Processor (MACDSP) beamformer/signal processor transitioned to AN/BSY-1 and 2 Acoustic Rapid COTS Insertion (ARCI)/Advanced Processing Build (APB).



Ms. Diane Kosky, Naval Surface Warfare Center, Division Panama City: Ms. Kosky has served the Undersea Warfare community during her career with her technical expertise in the area of Mine Countermeasures (MCM) tactics. Her experience during Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) with both unit and staff-level MCM tactics have served her well as evidenced

by her most recent accomplishment for the delivery of the Engineering Development Model (EDM) of MCM Commander's Estimate of the Situation (CES). MCM CES utilizes tactical rule-sets, developed by Ms. Kosky, to help automate and thus reduce the timeline for planning MCM operations.



Mr. William Robertson, Naval Air Warfare Center, Training Systems Division: Mr. Robertson is recognized for his contributions to Undersea Warfare training systems and for outstanding leadership as lead engineer for the Virginia Ship Control Operator Trainers (VSCOT) and fast attack training devices. His efforts spanned a full spectrum of training systems that included ship control, training and

maintenance as well as Electronic Warfare Support Measures simulation and stimulation. Mr. Robertson's knowledge and expertise of the Virginia Class training systems was unsurpassed and sought after by Program Managers involved with the acquisition and modification of these critical ship control training systems. His technical contributions to Undersea Warfare are directly reflected in the quality training systems in operation by today's Navy and in particular that of the submarine force.



Mr. Harold Watt, Naval Undersea Warfare Center, Division Newport: Mr. Watt's remarkable contributions in end-to-end systems engineering of numerous submarine sonar systems has had significant impact on all phases of program development, from concept definition through development and lifecycle support. He has been responsible for all aspects of submarine sonar, including: arrays

(Lightweight WAA); active and passive sonar including classification, tracking and localization (AN/BQQ-5, AN/BSY-2, AN/BQQ-10); acoustic communications (Ships Acoustic Modulator/Demodulator and Controller (SAMAC)); hull mounted and towed arrays (Lightweight WAA and TB-29A); and special acoustics and environmental sensors (AN/BQN-17A).

C4I/Combat Systems Technical Committee

PAUL K. ROSBOLT, CHAIRMAN
 DR. BOB ZARNICH, DEPUTY CHAIRMAN
 CAPT CHARLES DAVIS, COMMITTEE LIAISON



Under New Management

At the end of a terrific fall conference, Mike Tucker passed the baton committee leadership to me. At the same time,

Dr. Bob Zarnich, Metron, stepped up to be deputy chair. This completes a turnover process that really began a few years ago, when I relieved Jim Thompson as Navy Committee Liaison when he retired and became the committee deputy chair. I'd like to thank Mike Tucker for his outstanding leadership during the last several years, as both chair and deputy chair. In addition to setting up the conference technical sessions, Mike ensured that the committee was helping the Navy by leading several studies. Mike is continuing to serve on the USW Division Executive Board, working special projects for the division chair. I'd like to welcome Bob Zarnich to the deputy role. Bob recently shifted to industry after long and distinguished government service. Most recently, he was Director for Advanced Development, PEO IWS5A. Most of you probably know that organization as ASTO, where Bob was responsible for APB and advanced submarine sensor development. I'm also grateful to Jim Thompson, who although "retired," has agreed to continue to help with committee leadership.

We have a terrific line-up for the spring conference. We had so many paper submissions that we added an extra session, which will parallel the final (Thursday morning) session. The breakdown looks like this:

Wednesday Morning

Program Office and other upper level government briefs. These include NAVSEA PMS 425 (Submarine Combat Systems), NAVSEA PMS 435 (Submarine EO/IR systems), Navy Mine and ASW Command, the ASW Cross Functional Team (OPNAV N874) and Commander, Pacific Fleet.

Wednesday Afternoon

PEO IWS 5 (Undersea Warfare Systems) and several Undersea Warfare Decision Support System related papers.

Thursday Morning (Session A)

Undersea Warfare focused Open Architecture (OA) and Service Oriented Architecture (SOA).

Thursday Morning (Session B)

New concepts in Undersea Warfare C4I.

Breaking from our recent practice of holding the technical committee meetings on Monday, we will have our meeting over lunch on Wednesday. We will have an update about our ongoing studies, and a discussion about committee activities. If you have good ideas about how the committee can be more helpful to either the Navy or our membership, please come!

We have two ongoing Navy study activities. The communications findings of the Common Tactical Picture (CTP) study were presented to the Navy (OPNAV N6/N874, PEO IWS5) last fall, with emphasis on the need for non-satellite over the horizon communications relays and directional network waveforms such as DirectNet, especially as distributed networked systems evolve. Other areas of the original study including open architecture, ASW data strategy and system of systems

architectures are being implemented by the Navy as part of the ASW community of interest focus areas. The Navy has requested that the CTP study remain open subject to further requests and direction from the Navy sponsor.

The second study is a review of the draft PEO (IWS) Combat Systems Architecture Description Document (ADD). The ADD is intended to establish the objective combat systems architecture for future and backfit surface combatant combat systems. At the request for our Navy liaison, CAPT Davis, PEO IWS5, the committee conducted a review of the document to assess its impact on current and planned USW systems. Observations and analysis were made on both the technical and programmatic aspects of the document. A preliminary review was provided to PEO IWS5 and a final revision has been developed. CAPT Davis has requested an update and a time is being scheduled to provide a final statement of results. Final review and approval is expected later this year.



Aviation Undersea Warfare Committee

DAVE NELSON, CHAIRMAN
 MAX NORGART, DEPUTY CHAIRMAN
 CAPT LARRY PUGH, COMMITTEE LIAISON



Some would say that airborne USW is between a rock and a hard place. Others would point to the significant investment in the recapitalization of airborne USW

systems and say that things are moving in the right direction. It is our sense that the POM-10 build is going to be rather robust for airborne USW as well by ensuring the readiness of the P-3C, bringing the P-8A on-line, making the Broad Area Maritime Surveillance a program of record and continuing on with the helicopter master plan. Other focus areas having an affect on airborne USW emerging in the budget cycle are Maritime Domain Awareness and Intelligence Reconnaissance Surveillance and Targeting (ISR&T).

With all of the proposed new hardware you might ask, what keeps Navy leadership up



at night? Perhaps it comes back to the key ingredient of the art of USW, which arguably is the proficiency or experience of the crews that conduct those USW missions. Is the recapitalization effort accounting for several years of post Cold War lack of "real" world USW operational experience and training opportunities? Is the airborne USW infrastructure in place to produce sustained USW

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readiness across the emerging platforms? Is industry incentivized to continue investing in USW mission support?

We have found through a series of open source materials an insight into what perhaps is really concerning to Navy leadership. Foremost appears to be the lack of "hands" on real world opportunities to train for USW. The move away from traditional blue water training has given way to over land ISR missions that have essentially sapped the core ability to conduct effective airborne USW. The recapitalization of platforms and mission systems seems to address the lack of training opportunities with more agile aids to the operators such as active acoustic sensors and advanced "bell-ringers" incorporated into the passive sensor systems. The papers being presented at the technical session will emphasize these trends.

Part of preparing new generations of airborne USW crews includes the infrastructure to support the ability to man, train and equip the crews. Some critics of the Navy's ability to prepare skilled and integrated USW crews may be due to the lack of well established "center of gravity or centers of excellence" for USW preparation. During the Cold War, integrated USW training was an integral part of pre-deployment training. Aircrews used to spend days at a combined USW training site with surface and submarine crews to learn how to coordinate in a complex USW environment. It seems that little of that exists today. A lesson learned in air warfare might apply to this phenomenon. Naval Strike and Air Warfare Center was established to bring structure and commonality to tactics for carrier air wings. As the Naval Mine and ASW Warfare Command grows, the structure, tactics and certification process for deploying USW crews will benefit.



Airborne USW remains a critical part of the overall core competency for the Navy. The committee's work/review of emerging technical USW systems can provide a supportive review for our Navy partners from an industry perspective. 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.

Undersea Warfare Sensors Committee

JOSE RIO, CHAIRMAN
JUERGEN KEIL, DEPUTY CHAIRMAN
CAPT RICK NICKLAS, COMMITTEE LIAISON



Our theme this spring is USW Technology, Training and Tactics Supporting Forward Presence, Deterrence, Sea Control and Power Projection. These topics and mandates are key to continued superiority of the U.S. Navy now and in the future.

The inertia associated with our naval, industrial, and academe enterprise has led to a struggle and an overlong transition from the era before the 1990s.

Marginal progress continues to plague present efforts and the dwindling fund base is not helping. Our experience base seems to be evaporating through normal attrition but the backfill is not keeping pace. Moreover, there seems to be little incentive for the younger talent to invest the time and effort to fill this foundational gap. The healthy competition that has disciplined and forced us to be strong is now becoming corrosive and discouraging collaboration. As will be shown, however, these challenges are not going unanswered.

Fresh creative approaches to undersea networking are exploiting new sensors and sensor modalities including optical and relay systems.

Renewed efforts within the Navy to revitalize advanced development by judicious distribution of funds to key programs that cut across platforms and sensing capabilities are essential. There is a thrust to make better use of the marriage of ocean science and observed recorded sea data to improve training systems and to enhance automation capabilities. Improved automatic target recognition is leading to superior operator support and ultimate effectiveness.

A common problem that limits performance in the real world is the presence of acoustic distractors that confuse the operator and compromise the reliability of detection of short interval emissions that are strong source identifiers. This need is receiving considerable attention. New and old approaches are being combined in novel ways to overcome this deficit. Our contemporary threat is different than what was faced before 1990. Presently the SSK (Diesel submarine) has become much more important and the proliferation among the nations of the world has heightened concern especially in view of our mandate to exercise sea control and to project power. Of course, all of this must be accomplished without exposing our capital platforms to serious risk. The SSK threat is insidious because Diesels on battery are very difficult to detect passively. This consideration underscores the importance of active sonar and operator proficiency with the employment of active sonar together with the overall ability to combine both active and passive search to achieve best performance. Recent work with Continuous Active Sonar (CAS) is showing much promise in addressing this problem.

The application of Finite Element techniques are offering the promise of buying down the risks of new array development such as is very much needed if quantum jumps in performance are to be realized. Moreover, the forced conservatism that hampers significant breakthrough potential is considerably allayed.

Gains are being realized in the technology to improve the reliability of system infrastructure including cabling and interconnect designs that live up to the rigors of operation in a very hostile environment.

A major component in the cost of developing and selling off systems is the time it takes to guarantee performance within the required statistical confidence levels. Application of techniques that reduce test time without compromising buyer/seller confidence are an important step in maintaining affordability.

Training and the necessity to bring our technology into harness to fill the void left by the absence of the Soviets prior to 1990 is a must. A number of our technical presentations address this issue and the corresponding tactics to go along with our evolved capabilities. These programs and,

indeed, the thrusts provided by IWS5 are leading to capabilities that will fulfill our requirements and achieve an effective forward presence, and will stimulate the use of COTS and open systems to contain costs while at the same time maintaining performance and refreshable infrastructure.

"Our theme this spring is ... key to continued superiority of the U.S. Navy now and in the future."

Participation in the technical sessions this spring are showing signs of fresh participation in our forum and signal a renewed influx of new talent in our community. Moreover, this encouragement extends to technologies beyond COTS with an emphasis on maintaining the ultimate superiority of the U.S. Navy now and for the future.

I want to extend my thanks to Juergen Keil, our USW Undersea Sensors Committee Deputy Chairman, for providing invaluable assistance in organizing our agenda this spring. I also want to thank Kim Williams, Angie DeKleine and CAPT Bruce Roulstone, USN (Ret) who as always provide excellent support. I also want to thank CAPT Rick Nicklas, our USW Sensors Liaison, for his contribution to our technical agenda.

Undersea Vehicles Committee

RICH TALIPSKY, CHAIRMAN
 TOM SHERMAN, DEPUTY CHAIRMAN
 JIM GRIFFIN, COMMITTEE LIAISON



Unmanned systems continue to be at the forefront of discussion and development interest at the highest levels in the Department of Defense (DoD). The Chief of Naval Operations (CNO) recently convened an

Executive Board Meeting to address the Navy's vision for unmanned systems. The CNO's Strategic Studies Group (SSG) at the Naval War College has initiated a study which will focus on the Integration of Manned and Unmanned Systems. The NDIA USW Division USW Vehicles Committee is supporting the discussion by performing a study on unmanned systems technology.

DEFENSIVE SYSTEMS

Next Generation Countermeasure (NGCM) Closer to Bid – As a major step towards bringing the NGCM into reality, the Undersea Defensive Systems Program Office (PMS415) has hosted two industry days to provide detailed information about the procurement that is expected to go out for bid in June 2009. The goal of the NGCM program is to provide enhanced capability as well as to achieve cost savings through commonality by replacing multiple existing systems with just one.

Anti-Torpedo Torpedo Defensive System (ATTDS) Formally Entering Milestone B – Managed by PMS 415, the ATTDS is designed to provide hard kill capability to nearly all Navy warships (CVN, LHA, LPD, CG, DDG, etc.) with first application on the Arleigh Burke (DDG51) Class ships in FY15. Major subsystems will include an AN/SLQ-25D towed torpedo countermeasure system with upgraded countermeasures and active/passive detection sensors, upgrades to the AN/SQQ-89 Surface Ship ASW Combat System to include software and torpedo defense algorithm upgrades, MK 32 Surface Vessel Torpedo Tube upgrades, and the addition of hard kill anti-torpedo weapons.

UNMANNED MARITIME SYSTEMS (UMS)

Unmanned Surface Vessels (USVs) Roll Out With Littoral Combat Ship (LCS) Anti-Submarine Warfare (ASW) Package – The first ASW Mission Package for the LCS has been rolled out and will use several different vehicles including an MH-60R heli-



copter, a Vertical Takeoff Unmanned Air Vehicle and a USV. The USV will have a dipping sonar that will work in conjunction with a multi-static off-board source.

Opportunity for Unmanned Undersea Vehicles (UUVs) to Play a Key Role in Distributed Netted Sensors – The Naval Undersea Warfare Center (NUWC) Technical Director has selected Unmanned Distributed Netted Systems

(UDNS) as his "grand challenge" for the NUWC workforce. To help evolve the Navy's Concept of Operations for UDNS, NUWC has hosted a series of technical workshops, which will culminate in a fleet workshop this spring. The workshop is expected to provide for a detailed warfighting analysis to quantify the value of UDNS for ASW. There is potential for a high degree of relevancy and opportunity for UUVs in the scenarios that are expected to emerge from the process.

NDIA UMS Study – The study requested by CAPT Siegrist (Program Manager for Unmanned Maritime Systems (PMS 403)) is underway. The study is examining if there are significant advances in the "state of practice" in UUV technology since the last UUV master Plan. It is concentrating on vehicle autonomy, high-bandwidth communications, electromagnetic sensors, open architecture and hull materials to define technology advances that

"Unmanned systems continue to be at the forefront of discussion and development interest at the highest levels in the Department of Defense (DoD)."

support a plan to incrementally enhance existing systems. The study team expects to present draft findings to CAPT

Siegrist at the NDIA Spring USW Conference. Anyone desiring to participate in the study should contact Study Team Leader, Jeff Smith (jsmith@BluefinRobotics.com).

Participate in the UUV study technology survey: <http://www.zoomerang.com/Survey/survey-intro.zgi?p=WEB228SFB7V7KB>

Mine Warfare Committee

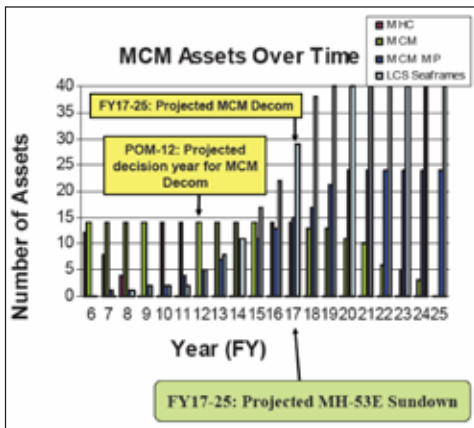
ERIC HOLMES, CHAIRMAN
 BILL KEY, DEPUTY CHAIRMAN
 GARY HUMES, COMMITTEE LIAISON



This update on the MIW Committee will focus on current MIW programs, the committee's Underwater Improvised Explosive Devices (UWIEDs) study and the U.S. Navy's mining capability and requirements. As we start 2009, the organic MIW programs continue the transition to production and IOC in support of the Littoral Combat Ship (LCS). Four of the organic systems are in low rate initial production and five are planned for IOC by the end of 2010, followed by two more in 2011. For the dedicated MCM forces, the Avenger class MCM ship upgrades are continuing.

The Osprey class MHC decommissionings are complete and their transfers to allied navies have been initiated. Concern arises from the slow build rate of LCS, the reduction in LCS MIW Mission Package procurement and the projected decommissioning of both the MCM ships and MH-53E MCM helicopters between FY17 and FY25. MCM systems capacity, promising to improve with the LCS, may be hampered by these decommissionings starting in FY17. The MCM support for US port and harbor UWIEDs only exacerbates this problem.

A non-LCS MIW capability will likely be needed starting the middle of the next decade. Attention needs to be placed on how the currently maturing organic systems can be adapted to alternative employment concepts and platforms or capabilities derived from these systems can be developed. Ideas on a MCM replacement platform should be entertained. In addition to this capacity issue, there are areas where the newer systems are coming up short. A few significant issues that have been highlighted by the community are the reduction in false alarms, the improvements in reliability, the very shallow water capability and a buried mine capability. Solving these issues will go a long way in providing better and more capable systems to the MIW operators.



The MIW committee study on UWIEDs is continuing, entering an important phase with a planned completion by mid year. Current Navy MCM assets are designated to provide the essential protection against UWIED attacks on our ports and harbors, yet they are clearly limited

resources for adequate response in the event of multiple UWIED events. The port and harbor UWIED study will provide recommendations on how to leverage those limited resources using unconventional approaches, in addition to new capabilities, to respond to the UWIED threat. The

"Current Capabilities and Gaps" effort, led by RADM Rick Williams, USN (Ret) (831.656.7702; rdwillia@nps.edu) is developing their report and "Assess Alternative Counter-UWIED Concepts" effort is scheduled to start shortly, led by Tom Casey (703.312.6288; thomas.a.casey@saic.com). Bill Key (617.901.2558; william.key@wktechgroup.com) has taken over as the director of the study. Please contact any one of these individuals to offer your participation.

Mining was a highlighted topic at the NDIA conference (Clambake) this past fall. Mining, which clearly can be an effective undersea warfare weapon for the U.S. Navy as it is for our adversaries, has received renewed attention from Navy leadership. Mining can be used to deny the use of certain areas to enemy surface and submarine forces, prevent the enemy's use of specific ports, block passage of enemy through straits or narrows and deny the enemy the use of certain maritime routes through littoral waters. Today's technology allows mining to avoid the indiscriminate nature and too hard to clear characterizations of the past, while complying with International requirements.

"Today's technology allows mining to avoid the indiscriminate nature and too hard to clear characterizations of the past, while complying with International requirements."

Investment in mining and mining research and development is minimal. A new mine has not been developed in more than 20 years. Only the Quickstrike series still exist in inventory; these air-delivered

shallow water mines are being upgraded with a modern Target Detection Device. R&D funding for mine improvements to sustain effectiveness of sea mines is approximately \$12 million during the next five years, while mine technology development is woefully insufficient at \$1 million over the same time period. The Navy should initiate the development and procurement of a modern family of sea mines optimized for potential future military encounters associated with expeditionary warfare in the littoral regions. Offensive mining can be key to power projection and battlespace dominance, including forward area ASW.

The new generation mine, as briefed by the mine customer advocate, has been shown to be sufficiently smart to comply with international regulations on the use of sea mines while providing significant asset leverage in applications such as defensive mining for sea base or other forward base protection or offensive mining for containment of enemy assets in home ports to extend surface and sub-surface effectiveness in both offensive and defensive operational scenarios. A new generation mine program has been considered by some to be of limited value in this era of lightning strikes using air and/or missile assets. A careful analysis of offensive and defensive mining concepts will reveal that this warfare technique can be extremely cost effective and provide an important ASW (not MIW) capability.

The MIW committee lunch session (Wednesday, 11 March) provides a unique opportunity for the community to discuss trends and issues over a complimentary lunch. Feedback from participants has been good, indicating the value of the ability to exchange ideas between members of the community. This type of interchange is important, where we can focus our MIW efforts toward issues such as the MIW Integrated Prioritized

Mine Warfare Committee

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Capabilities List (ICPL), which can provide us with a better understanding of the requirements of the operational community.

I want to conclude with thanking Gary Humes, out-going PMS 495, for his support of the MIW committee as the sole liaison for the past few years.

In addition to guiding the organic MCM systems through development and into production, he helped this committee with implementation of the full sessions at the clambake and varied and interesting topics at both fall and spring sessions. Speaking for the MIW community, we wish him well in his future endeavours.

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Spring Undersea Warfare Division Conference: March 9-12, 2009

WAYNE JAKUBOWSKI, SPRING CONFERENCE CHAIRMAN



This year's conference theme "USW Technology, Training and Tactics Supporting Forward Presence, Deterrence, Sea Control, and Power Projection" is closely aligned with the focus areas outlined by our Chief of Naval Operations (CNO), ADM Gary Roughead. In his address to the Surface Navy Association in January, he emphasized the need for "lean, mean fighting machines" and harnessing the right technologies to provide the mix of needed capabilities . . . anti-submarine warfare . . . mine warfare . . . and irregular warfare. Each of these topics will be addressed at the plenary and technical sessions. In addition, the CNO also drove home the

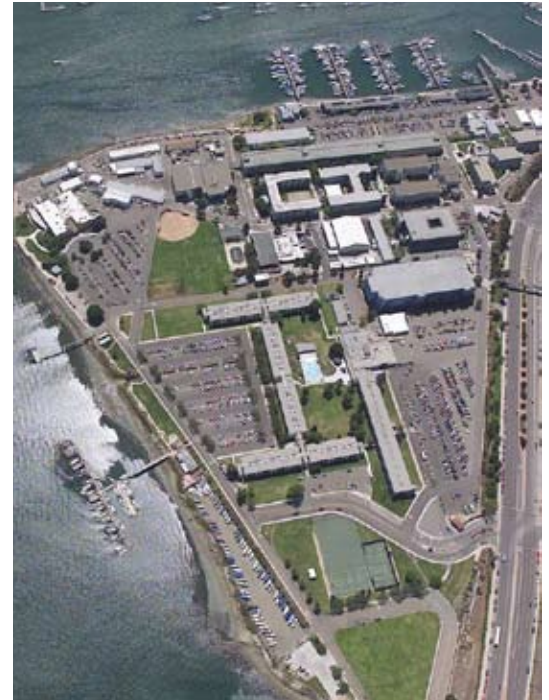
message that technology was needed to "reduce overall expenses." This could be achieved with up-front investments such as open architecture, modularity and minimal manning technologies. Each of these topic areas will be addressed during this conference.

We have the right speakers at this year's conference. Our operational perspective will be framed by the Commander Third Fleet, VADM Samuel Locklear; Commander Surface Forces Pacific, VADM Derwood Curtis; and supplemented by submarine commanding officer's debriefs of recent operations later in the day. The real score card, however, will be briefed by our conference host RADM Frank Drennan in his role as Commander, Naval Mine and Anti-Submarine Warfare Command. The acquisition side will be supported from the perspective of our PEOs and supplemented by the first time participation of NAVAIR's, VADM Dave Venlet. In addition, this year's conference will also include information on applicable technology projections for this warfare area from the Office of Naval Intelligence. Tuesday's plenary session (10 March) is followed by a series of technical sessions all easily attended within the Admiral Kidd Conference Center, San Diego.

This year's classified (SECRET) conference will include technical tracts that include: 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. The 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 recipients of three individual awards, recognizing key contributions to Undersea Warfare.

As far as 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 newly implemented Mongolian barbecue to be held Tuesday evening at the Hyatt immediately following the plenary session.

We look forward to a professionally rewarding conference, great weather, and an enjoyable Mongolian barbecue.



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

" In his address to the Surface Navy Association in January, he (ADM Gary Roughead) emphasized the need for 'lean, mean fighting machines' and harnessing the right technologies to provide the mix of needed capabilities..."



Raytheon Integrated Defense Systems

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