



NATIONAL DEFENSE INDUSTRIAL ASSOCIATION

STRENGTH THROUGH INDUSTRY & TECHNOLOGY

UNDERSEA WARFARE DIVISION



The Year of Momentum – RADM Frank M. Drennan, Commander, Naval Mine and Anti-Submarine Warfare Command (NMAWC)



RADM FRANK M. DRENNAN,
USN, COMMANDER, NMAWC

Once again, I'm pleased to provide the introduction to the NDIA Undersea Warfare Division's Spring Newsletter. Upfront, I'd like to thank the division's leadership and members for another year of invaluable association with the Naval Mine and Anti-submarine Warfare Command. As Commander of the Navy's Center of Excellence for MIW and ASW, I value our association with NDIA and its members and believe a continuing strong partnership is crucial to

the long-term effort to achieve and sustain our goal of dominance in the undersea domain.

Our partnership has in no small measure been a factor in what we achieved in 2009, which, by many measures the Navy uses to assess the health of MIW and ASW, was a year of progress. In 2009, key fleet performance measures showed improving trends, more capable systems arrived in the fleet, and there was unprecedented focus and alignment of effort by stakeholders on MIW and ASW challenges. As a result, we began 2010 with considerable momentum toward our goal.

Through various engagement venues throughout the year, NMAWC seeks to provide industry with an understanding of the threats, the elements of current MIW and ASW doctrine to counter those threats, how the elements are carried out in relevant operational situations, and lastly the gaps in capability to achieve mission objectives. I'm convinced that understanding our capability gaps within the context of our threats and tactics helps industry partners provide solutions that can be applied to a wide range of undersea challenges.

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In order to maintain the momentum we gained we'll continue to rely on our industry partners' strengths at combining new technologies with world-class engineering to address our capability requirements. Through our Warfighting Improvement Programs,

fleet ASW and MIW stakeholders identify and prioritize the gaps in capability known as Integrated Priority Capability Lists. Once approved, these IPCLs provide fleet consensus on near-term requirements needed to accomplish MIW and ASW mission.

Generally speaking, the IPCLs point to gaps in the following areas: solutions to enhance detection and classification of increasingly stealthy undersea threats; tools that help our operators more efficiently and effectively find these threats amongst enormous amounts of ambiguous

NMAWC LETTER CONTINUED ON PAGE 2

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The Year of Momentum

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sensor data; common tactical and operational views of the undersea battlespace to support accurate decision making and rapid engagement; advanced undersea weapons; and improved simulation for operator training and proficiency.

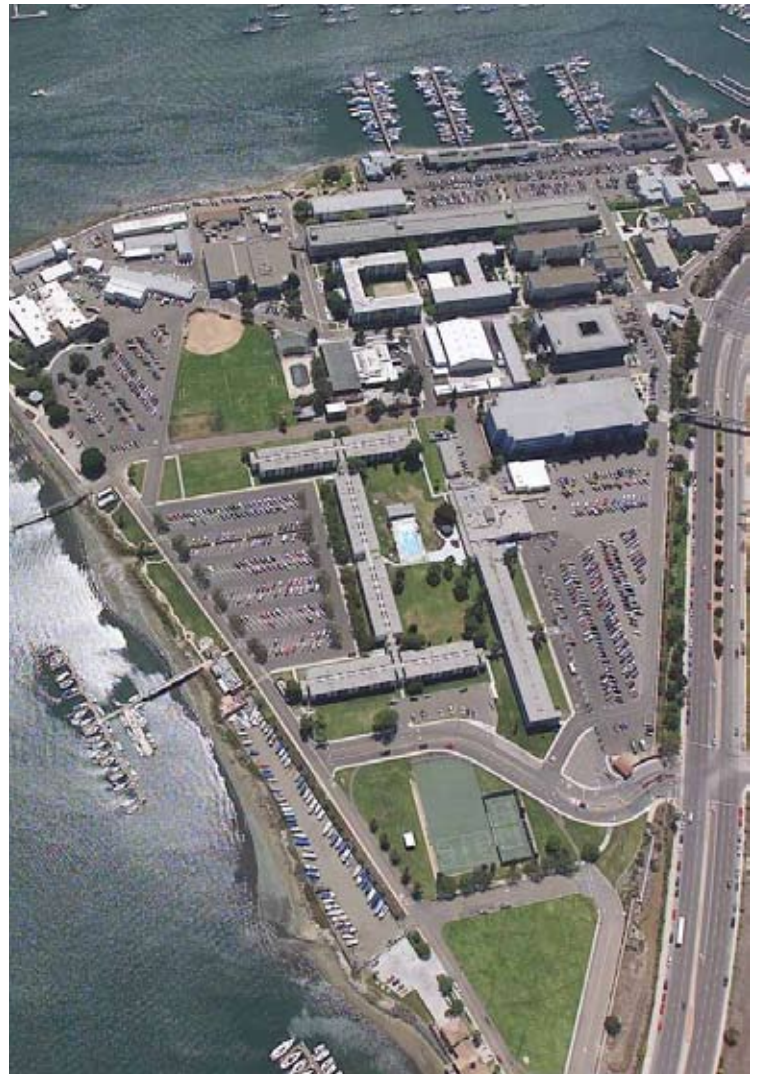
As we address these gaps, we must keep in mind that undersea threats to our forces are not static. Our potential adversaries are thinking and learning and can

change quickly often using the same technology available to us. If we are to stay ahead of these threats we must not only seek out innovative solutions but also field them more rapidly. Solutions, as well, must be adaptable and scalable to allow us to address threats we did not anticipate at the outset of development.

In the past ASW and MIW were addressed as distinct entities, driving capability and associated capacity in specific directions. We continue to see these mission areas converging, with the introduction of mobile mines and unmanned underwater vehicles we advocate for a common undersea approach to solutions. NMAWC will continue to build bridges between organizations that traditionally focused exclusively on ASW or MIW.

As I prepare to turn over command of NMAWC, I am pleased to announce that RADM Scott Hebner has been named as my relief. RADM Hebner recently commanded Carrier Strike Group 7 and the Ronald Reagan Strike Group, and will bring a wealth of experience and talent as commander of NMAWC. He is clearly the right person to continue the progress the Navy has made in MIW and ASW.

In closing, I am excited about the momentum we've built over the past few years in MIW and USW. I have personally observed greater leadership focus on ASW and MIW and the feedback from the "deck plate" and industry on how our Navy can improve with new technology, training and processes is increasing. Most importantly, our operators are showing a positive trend in ASW and MIW proficiency. Industry's and NDIA's work and partnership are key to sustaining our progress and dominance in USW. I'm thankful to have been part of a strong military-industry partnership and am confident that partnership will continue to enable us to meet any challenge.



NMAWC COMPLEX, NAVAL BASE PT. LOMA

HEADQUARTERS, NAVAL MINE AND ANTI-SUBMARINE WARFARE COMMAND

Division Chair's Update

BRUCE SPEAR, UNDERSEA WARFARE DIVISION CHAIRMAN



Our Spring Conference Theme: "Undersea Superiority – Realities, Challenges and Opportunities," addresses the dichotomy between the missions the Navy is being asked to perform and the reality of the Navy being able to do all that is being asked of it. While our Navy is the best in the world it is becoming asset/capability limited in the area of Undersea Warfare due to budget shortfalls and priority. It is unlikely in the present budget environment that large

amounts of money will start flowing anytime soon so it is up to all of us to provide the best warfighting performance we can with the resources available. We have picked the theme of this conference to further address the challenges and opportunities for our Undersea Warfare industry to make a difference.

"While our Navy is the best in the world it is becoming asset/capability limited in the area of Undersea Warfare due to budget shortfalls and priority."

I say further address because in our report last fall to the Secretary of the Navy on the "State of the Undersea Warfare Industrial Base" we discussed the impact of declining budgets and changing priorities on the industry's ability to provide the cutting edge technologies that our Navy will need to continue to be the world leader in Undersea Superiority. While we focused on the challenges facing the Industrial Base we also related those challenges back to the drivers of declining budgets, increased missions, new threat capabilities, and the need for funding the War on Terror.

We based our recommendations on meeting the following objectives

- Align and prioritize requirements with projected future threats
- Integrate and leverage investment across industry and government
- Balance R&D expenditures across new development and modernization
- Address the critical industrial and human capital trends and shortfalls

Our report focused our assessment around six pillars

- Requirements
- Technology
- Budgeting
- Operations and support
- Research and development
- Vitality and capacity

We recommended the following actions

- Assign the NDIA UWD Navy Liaison Officer to the Navy USW Cross Functional Board to enhance the industrial base perspective of this team. Also empower and authorize this representative to share relevant information with the UWD leadership. UWD roundtable events could be used as a forum to ensure compliance with government regulations.
- Formalize the UWD relationship with NMAWC to enable first hand dialogue, information sharing, and access to capability assessments of both the operational tools and industrial base.

- Consider expanding the UWD role to include relationships with principal allied stakeholders and complementary non-U.S. based USW technology providers. This would require processes and procedures which might be similar to those used in current industry dealings with the export of technical data (e.g., data licenses of technical assist agreements).
- Promote scholarships and incentives for students in technical college degrees to broaden the seeds of interest in USW studies.
- Utilize the flexibility incorporated in the National Security Personnel System to recruit/retain USW expertise (e.g., form a "Community of Interest or Practice" or make strategic decisions in government technical or acquisition positions to raise the visibility and enhance the talent pool).

In response to our report, Geoff Fein in an article published in the December 17, 2009 issue of "Defense Daily" provided additional insight into the challenges for sustaining Undersea Warfare superiority, acknowledging our objectives, conclusions and recommendations and spreading our message to a larger audience.

Also in another related article published in the November issue of "Sea Technology," I proposed that the USW community take a "partnering" approach between the Navy, academia and industry to focus USW requirements, budgeting, R&D and acquisition. Through partnerships, the provider of specific services can be selected for the most cost-effective approach to meeting the USW operational demands being placed on our Naval forces. I recommended near-term objectives to align and prioritize R&D and acquisition requirements with projected future threats; balance R&D expenditures across new development and modernization; integrate and leverage investment across industry and government; develop programs with adequate work mix and funding to sustain a capable work force and physical infrastructure; apply available funding to maximize delivery of products by eliminating duplicate efforts, assigning roles and work for the most cost-effective execution and eliminating underutilized facilities; and address critical industrial and human capital trends and shortfalls.

At our Undersea Warfare Division (UWD) Executive Board meeting being held in conjunction with this year's Spring Conference we will be electing a new Division Chairman. I have thoroughly enjoyed my term as Chairman of the Undersea Warfare Division and look forward to continuing to serve the Division in any capacity that is needed. We have a strong division as evidenced by the participation in our conferences and technical studies. This has been possible because of all of the efforts by our Technical Committee Chairmen, Conference Chairmen, our Executive Board Members and Advisory Council Members. I thank each one of you who has contributed your time and energy to making our Undersea Warfare Division a success. I also thank our active duty Navy personnel and civilian personnel at Fleet Commands, Navy Headquarter Commands and Navy laboratories for your support of our conferences and studies and for your service to our nation.

Fall 2009 NDIA UWD Bronze Awards

BOB KITTREDGE, AWARDS CHAIRMAN



The **NDIA UWD Bronze Award** recognizes outstanding individual achievements in either science or engineering in the field of Undersea Warfare, and is presented 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 accomplishment 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 four Bronze Medal Awards during the Plenary Session of the Fall 2009 USW Conference in New London, CT.



Mr. Michael Adams, Naval Air Warfare Center, PAX River, MD: Mr. Adams' contributions in the area of acoustic sensor stimulation systems development for Undersea Warfare applications have formed the basis for current and next generation acoustic sensor stimulation systems for the United States Navy. Over the past 30 years, Mr. Adams has made outstanding contributions to

the real-time stimulation of acoustic processing suites used by all Anti-Submarine Warfare (ASW) aircraft. He developed the Multichannel Programmable Acoustic Processor Stimulator (PAPS) system to test and evaluate the integration of ASW hardware and software, including the SSQ-36, 53, and 62 families of sonobuoys, the Extended Echo Ranging, Improved Extended Echo Ranging, and Advanced Extended Echo Ranging systems, into the P-3C, MH-60R, and P-8A aircraft. Mr. Adams is recognized by both government and industry as the "father of the PAPS system" and PAPS is recognized as the industry standard acoustic sensor stimulation system for sonobuoy processor systems.



Mr. Ernest Correia, Naval Undersea Warfare Center Division, Newport: Mr. Correia has compiled an extraordinary record of technical accomplishments, leadership and service to the Navy and its undersea warfare capabilities in the areas of torpedo analysis, modeling and simulation (M&S), and submarine combat control systems. Mr. Correia was a key driver/conceiver/developer

of the Weapons Analysis Hardware in-the-Loop Facility (WAF) that was recognized as the Navy's highest fidelity M&S capability and termed a "national asset" by COMOPTEVFOR. He forged unique linkages between the WAF and the Submarine Multi-Mission Team Trainer (SMMTT) that resulted in a unique Fleet capability providing real-time reach-back training for remote activities, such as Submarine Command training prior to at-sea exercises. Mr. Correia's technical expertise and leadership skills have cultivated an environment of innovation, collaboration, and inclusion in all that he has done.



Mr. Richard Loeffler, Naval Surface Warfare Center, Carderock Division: Mr. Loeffler's contributions in the area of Sonar Tactical Decision Aid (STDA) design and development for Undersea Warfare applications has resulted in a common system that provides highly effective and accurate predictions of acoustic signature vulnerability for both ownship and threat

forces. For the first time in the Navy, acoustic prediction is common across submarine, surface, surveillance, battlegroup and theater-level systems. Mr. Loeffler's expertise has also been recently utilized in applying the technology developed for the Submarine Multi-Mission Team Trainer to the design and implementation of the Surface ASW Synthetic Trainer, thus again achieving commonality.



Mr. G. Scott Peacock, Naval Air Warfare Center, Training Systems Division: Mr. Peacock's contributions in the areas of automation and signal processing for Undersea Warfare applications are directly reflected in the current advances of surveillance and tactical sonar systems in use by Fleet operators at sea today.

In particular, Mr. Peacock's contributions to the automation of feature detection and advanced display designs have enabled significant improvements in operational performance for those systems. He devised, developed and tested innovative algorithm approaches aimed at improving Undersea Warfare enterprise capabilities, with emphasis in the area of passive sonar detection, classification, localization and tracking. Mr. Peacock has achieved much success, as more than 40 of his algorithm approaches have transitioned for use into Fleet surveillance and tactical sonar and combat systems.



NDIA UWD Academic Fellowships

DR. CHARLES ZENTNER, ACADEMIC FELLOWSHIP CHAIRMAN



The NDIA UWD has funded an Academic Fellowship program since 1990 for students pursuing graduate degrees in technology areas associated with undersea systems. The purpose of these fellowships is to promote the development of scientists and engineers in the undersea area. Academic Fellowships are provided annually to a graduate student candidate at the University of Texas, the

University of Washington and the Pennsylvania State University. Each fellowship awardee received a \$6,000 stipend from the NDIA UWD.

The NDIA UWD Academic Fellowship awardees for the 2009–2010 academic year:

Theodore F. Argo IV has been awarded the NDIA UWD fellowship at the University of Texas at Austin. A Ph.D. candidate in Mechanical Engineering, his research studies are in the acoustic properties of sediments. Mr. Argo is scheduled to receive his degree in May 2010.

Jeffrey P. Rinehimer has been awarded the NDIA UWD fellowship at the University of Washington in Seattle. A Ph.D. candidate in the Civil Engineering Department, Mr. Rinehimer is studying the use of infrared techniques for remote environmental sensing of tidal areas. His research is part of a large-scale study sponsored by the Office of Naval Research. He is scheduled to receive his degree in June 2013.

Chad M. Smith has been awarded the NDIA UWD fellowship at Pennsylvania State University. A candidate for a master's degree in acoustics, Mr. Smith is studying acoustic propagation in a dynamic water column environment. His research includes in situ measurements to verify his theoretical work. He is scheduled to receive his degree in May 2010.

Congratulations to our NDIA UWD Academic Fellowship awardees.



DR. CLARK PENROD, ARL/UT EXECUTIVE DIRECTOR, THEODORE F. ARGO IV, AND DR. RICH GRAMANN, DIRECTOR, ARL/UT ENVIRONMENTAL SCIENCES LABORATORY



CHAD M. SMITH AND DR. EDWARD LISZKA, ARL/PSU DIRECTOR



DR. JIM THOMSON, AN OCEANOGRAPHER AT APL/UW AND MR. RINEHIMER'S ADVISER, JEFFREY P. RINEHIMER, AND DR. BOB ODOM, APL/UW ASSISTANT DIRECTOR FOR EDUCATION

Undersea Mine Warfare Committee

ERIC HOLMES, CHAIRMAN

BILL KEY, DEPUTY CHAIRMAN

DONNA CARSON-JELLEY (PMS 495), NAVY LIAISON



The Underwater IED (UWIED) study will be wrapping up by early summer. The Spring Conference may be your last opportunity to volunteer to help. There is increased interest in UWIEDs in N85 and NMAWC, as the Navy and their MIW systems will be called upon if there is a real or perceived threat. Retired ADM Harry Ulrich, a former commander of Naval Forces Europe, gave a bleak prognostication

during a recent conference. A major maritime calamity is coming, he warned, inquiring how we are doing with protecting our seaports and further warning "that since insurgents have become so adept at using roadside bombs, they should have no trouble planting what he called 'maritime bombs' (i.e., mines) in American harbors." Consider participating in the study if you're interested.

The MIW Committee has continued to generate strong interest within the community by providing a gathering of government, industry and academia. The Fall Conference technical sessions were a clear indication of this with presentations from three PEO LMW program offices (PMS 495, PMS 403, and PMS 420), our resource sponsor N852, and the Fleet represented by NMAWC. The community is actively engaged in the transition of U.S. Navy MIW in locations (Corpus Christi to San Diego) and capability (legacy to organics/LCS). These conferences are an excellent opportunity to engage Navy MIW representatives during the MIW Committee technical sessions regarding these transitions.

Dr. Andrew Erickson, an Associate Professor in the Strategic Research Department at the U.S. Naval War College and a founding member of the department's China Maritime Studies Institute (CMSI), provided an eye opening presentation on the extensive Chinese mine warfare capabilities and operations. Directly preceding the Secretary of the Navy, he clearly showed to the full clambake audience the significance of MIW and why what we do is so important.

Over the past year we have been able to secure significant participation from government attendees as they have been making up a greater percentage of the presentations during the technical sessions. This is Industry's opportunity to get some ideas out to a broad audience, introducing them to government, academia and others in industry, potentially opening up additional opportunities and establishing valuable relationships. We would like to see a greater number of Industry presentations at future conferences.

In addition to our conferences, MIW is expected to be better represented at the NDIA Expeditionary Warfare Conference (Fall conference in Panama City, FL) as we have made strides in improving collaboration between the Undersea Warfare Division Mine Warfare Committee and the Expeditionary Warfare Division and its Littoral and Mine Warfare Committee.

"A major maritime calamity is coming ... warning that since insurgents have become so adept at using roadside bombs, they should have no trouble planting what he called 'maritime bombs' (i.e., mines) in American harbors."



QUICKSTRIKE SERIES OF MINES: AIR-DEPLOYED VIA F/A-18

Much is happening in MIW. The transition of the MCM class ships from Ingleside, TX to Point Loma is complete, the focus of MIW mission package integration has shifted to LCS-2, USS Independence, and the organic MCM systems continue to make progress. MIW leadership is changing as RDML Bob Girrier, Vice Commander NMAWC, has been assigned as Commander Carrier Strike Group Eleven. The Admiral has been a staunch advocate of MIW and a wonderful interface to the MIW Industry community.

The Naval Oceanography Mine Warfare Center (NOMWC) has been in the forefront of using unmanned undersea vehicles with integrated MIW sensors. Their systems have been used in MCM surveys of U.S. military ports. Lessons learned from these surveys and numerous exercises include a number of different environments, challenging high clutter bottoms, and improved Post Mission Analysis (PMA). NOMWC will discuss their operations and lessons learned during the committee technical session.

Mining is also gaining the interest of the Fleet who see the potential capability that can contribute to the overall ASW mission. Currently the U.S. Navy has a severely limited ability to conduct mining operations. Our Quickstrike series of air-deployed mines were developed in the early 1980's to target surface ships. We've heard about our adversaries' mine inventories, their capabilities and the quantities, and the great lengths we go to counter these capabilities. The U.S. Navy's capabilities pale in comparison. How do we reinvigorate a capability that has not had the focus or the funding for quite a few years? Expect more discussion of this in the near future.

Times are interesting and exciting for MIW. Systems are being delivered, but capability gaps still exist. Opportunities exist as we work cooperatively to solve the MIW problems ahead of us. Please join your colleagues in the technical sessions here in San Diego as we discuss the future of U.S. Naval MIW.

Undersea Vehicles Committee

RICH TALIPSKY, CHAIRMAN
 TOM SHERMAN, DEPUTY CHAIRMAN
 JIM GRIFFIN, NUWC DIVISION NEWPORT, NAVY LIAISON



Unmanned Vehicle Systems Navy N2/N6 and PEO (U&W) Coordination for Navy Unmanned Efforts

A new focus on unmanned systems command and control, information and intelligence, has come with the merger of the Navy offices of the Director of Intelligence (N2) and the Deputy Chief of Naval Operations for Communication Networks (N6) into a single entity that formed a single coordination and governance of U.S. Navy CyberWarfare. Their role has been expanded to include the role of resource sponsor for coordination and integration of Unmanned Systems. As part of the reorganization, N2/N6 is charged with the responsibility of overseeing all Navy Unmanned Systems and has assumed responsibility over all Submarine Warfare (N87) and Oceanographer of the Navy (N84) maritime unmanned vehicle efforts as well as the Mine and Expeditionary Warfare (N85) and Surface Warfare (N86) unmanned vehicle programs.

The Navy Program Executive Officer for Unmanned Aircraft and Strike Weapons (PEO U&W) has taken the Navy lead on unmanned systems (UxS) integration. This makes the PEO (U&W), currently RDML Bill Shannon, the "UxS focal point" within the organization of the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA). Word is that this is not to be construed as usurping any of NAVSEA's or other PEO's roles in developing UxS within their portfolio, but rather serves to designate a single point of contact and coordination for ASN RDA on UxS.

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NDIA to Work Jointly with the Naval Undersea Warfare Center to Sponsor Summer Unmanned Maritime Vehicle (UMV) Technology Symposium

The Naval Undersea Warfare Center Division, Newport (NUWC DIVNPT) and the NDIA share a joint interest in the growth of technologies and new levels of Systems Engineering in Unmanned Maritime Systems (UMS) to enable next generation Undersea Warfare (USW). NUWC DIVNPT and the NDIA have decided to jointly sponsor a two-day conference on UMV Technology in development at government, university, and private sector laboratories. The conference, that will be held this summer in Newport, RI, will have both classified and unclassified sessions. The conference will be an opportunity to potentially expand the local and national technology base through new business development.

Undersea Defensive Systems NGCM Prime Contractor Selection Under Evaluation

The Navy has closed its solicitation for the development of the Next Generation CounterMeasure (NGCM). The goal of the NGCM is to provide enhanced capability as well as to achieve cost savings through commonality by replacing multiple existing systems with this one system. The NGCM (designated the ADC MK 5 MOD 0) is a three-inch diameter expendable acoustic countermeasure which can be launched from the submarine Internal Countermeasure Launcher (ICL) or the Countermeasure Set, Acoustic (CSA) countermeasure launch system. It will utilize adaptive countermeasure technology, developed under the

Office of Naval Research Future Naval Capability program, to provide variable acoustic modes of operation including stationary broadband jamming, spot jamming, echo repeat, and mobile decoys. It is designed to increase submarine probability of survival against threat acoustic-homing torpedoes. The NGCM, along with a Tactical Decision Aid and a network-integrated CSA are components within a "System of Systems," called the Submarine Torpedo Defense System (SUBTDS). The selected contractor will support design development, software development, test and evaluation, associated program management, data management, systems engineering, hardware reliability and maintainability, and integrated logistic support required for the development and fabrication of the NGCM.

"... N2/N6 is charged with the responsibility of overseeing all Navy Unmanned Systems ..."

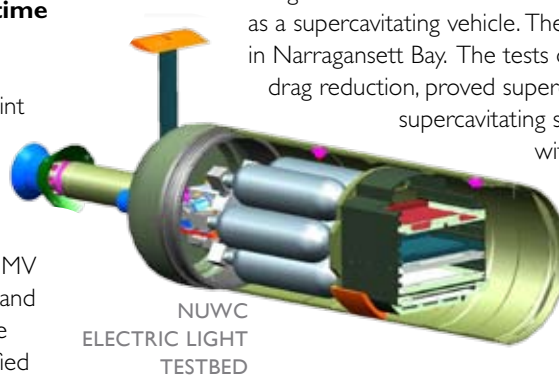
terms engineering, hardware reliability and maintainability, and integrated logistic support required for the development and fabrication of the NGCM.

It will cover the period of Acquisition Milestone Phase B (MS-B). The development will include several variants of Engineering Development Models that will culminate in a configuration as close as possible to the production configuration to enter into MS-C. The follow-on MS-C Phase will be a separate contract that will provide for limited Low Rate Initial Production (LRIP) and Full Rate Production (FRP).

Undersea Weapons Electric Lightweight Torpedo Test Bed Allows for Supercavitating Technology Testing

A NUWC-designed testbed that is based on the 12.75-inch diameter lightweight torpedo has been developed to test supercavitating technology. A cavitator, control surfaces, ventilation system and array were designed and built to allow the NUWC Electric Light Testbed to operate as a supercavitating vehicle. The free running system was recently tested in Narragansett Bay. The tests demonstrated cavity formation, measured drag reduction, proved supercavitating vehicle control, and produced supercavitating self-noise data. The system will be deployed

with enhanced speed, maneuverability, and homing features in the future to understand supercavitating physics and demonstrate prototypic weapon characteristics.



NUWC ELECTRIC LIGHT TESTBED

UNDERSEA VEHICLES COMMITTEE
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NUWC ELECTRIC LIGHT TESTBED ALL-UP-ROUND

Undersea Sensor Systems Committee

JOSE RIO, CHAIRMAN

JUERGEN KEIL, DEPUTY CHAIRMAN

CAPT RICK NICKLAS (PMS 401), NAVY LIAISON

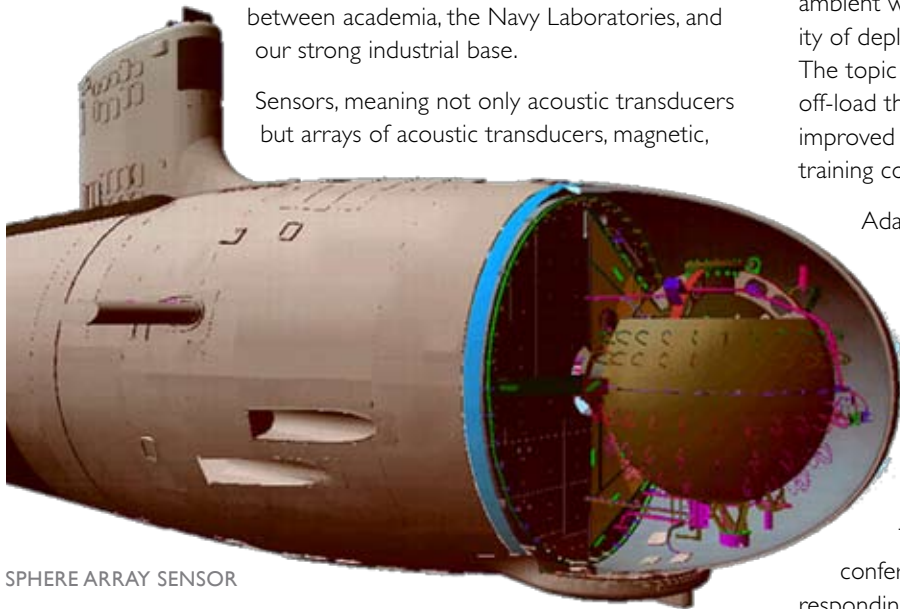


Our theme for this conference is: Undersea Superiority – Realities, Challenges and Opportunities. Engaged as we are as a nation trying to maintain global stability we have a limited set of options: diplomacy and projection of power. It is the second of these with which we are concerned here. Given the un-

certainty of geographic base of operations we must rely heavily on sea power. Indeed, our carrier force can provide the proximity needed to carry out military missions without alienating potential allies in the vicinity that could be politically compromised by endorsing the necessary intervention.

To project seapower it is necessary to have unchallenged Undersea Superiority and to achieve this necessity we must face the contemporary reality that the focus of warfare in general is dramatically different than what most of us grew up with. We have always had challenges in bending physical reality to achieve our ends and this extends to exploiting technology without being trapped by the limitations that are concomitant with particular technologies and the market forces driving them. All of the preceding can be neatly summed up by declaring that opportunities exist for all of us in this collaboration between academia, the Navy Laboratories, and our strong industrial base.

Sensors, meaning not only acoustic transducers but arrays of acoustic transducers, magnetic,



SPHERE ARRAY SENSOR

electrostatic, electromagnetic and chemical play a central role providing the capabilities needed to protect our force and kill the enemy when it is necessary to project power. Moreover, the processing, and processing technologies needed to make our sensors effective, as effective as necessary to guarantee mission success and protect our fighting force, are intrinsic to the sensor. The program in place for this Spring Conference will give a sense of where we stand in our mandate to provide unchallenged superiority in the face of present day realities and in our determination to exploit opportunities to the fullest.

The sensors focused technical sessions for the Spring Conference are very well rounded with several participants from various government organizations, including PEO IWS5, PMS 485E, NUWC, SPAWAR-SCP, NSWV-PCD, and NAVOCEANO, from academia, including Johns Hopkins University/Applied Physics Laboratory and Stevens Institute of Technology, and from industry, which alone will comprise approximately 50 percent of our participants.

“Engaged as we are as a nation trying to maintain global stability we have a limited set of options: diplomacy and projection of power.”

Initiatives in a broad number of areas including Advanced Processor Builds (APB), Distributed Netted Sensors (DNS), Scaled Improved Performance Sonar (SIPS), Multi Function Towed Array (MFTA) Advanced Capability Builds for SQQ-89 A(V) 15, Continuous Active Sonar (CAS), Reliable Acoustic Path (RAP) Vertical Line Array (VLA), Conformal Acoustic Velocity Sonar (CAVES), Foreign Military Sales (FMS), Integrated Logistics Support (ILS) and USW Decision Support System (DSS) are being ably coordinated through the efforts of IWS 5 to ensure maximum pay-off.

Our program will include a wide range of topics that support the warfighter in ways that provide real gains against present day threats. We have techniques for validating system performance in cost-effective ways by reducing test time. We have better capabilities for assessing the ambient waveheights and subsurface currents that facilitate interoperability of deploying platforms and Autonomous Underwater Vehicles (AUV). The topic of automated contact classification and feature extraction to off-load the operator is covered in several different presentations and improved simulation techniques to predict performance and support training complement this topic nicely.

Adaptive feedback control to counter fades is exploited in a presentation on acoustic communications and multi-band active torpedo processing is used to increase the effectiveness of torpedo targeting in shallow areas against slow moving or even stationary targets. The Deep Water Active Distributed System (DWADS) is taking advantage of newer technology with its compact high power projector and improved sensors for bioluminescence to help the Navy effectively protect its assets.

This is but a very brief preview of the topics covered in the conference and the status of how we as a dedicated group are responding to the challenges and the realities.

I want to extend my thanks to USW Undersea Sensors Committee Deputy Chairman, Juergen Keil, for providing invaluable assistance in organizing our Spring Conference's agenda. Thanks are also due to Dr. Amy Smith who has graciously agreed to assist in our committee activities. I also want to thank Kim Williams and CAPT Bruce Roulstone USN (Ret) for their excellent support.

Undersea Warfare Aviation Committee

DAVE NELSON, CHAIRMAN
 MAX NORGART, DEPUTY CHAIRMAN



The FY11 budget and the 2010 Quadrennial Defense Review (QDR) became public record in early February and aviation USW programs did well. Sea control, one of the six core capabilities, was highlighted by the continued investment in airborne USW systems. In his budget rollout statement the Secretary of the Navy stated the ability to operate freely at

sea is one of the most important elements of joint and interagency operations. The growing number of nations operating submarines is among the most significant challenges to our ability to exercise sea control. The budget documentation indicated that out of 1,000 planned platforms for procurement over the Future Years Defense Plan, 215 were dedicated to USW.

Having recently entered its test phase, the P-8A Poseidon Multi-Mission Maritime Aircraft (MMA) will replace the P-3C maritime patrol aircraft, first introduced in 1969. With its modern, capable sensors and robust communications, the P-8A (IOC 2013) will provide persistent undersea and anti-surface warfare capabilities as well as ISR and will be complemented by the long dwell ISR capability of the Broad Area Maritime Surveillance (BAMS) system.

The RQ-4 BAMS system development and demonstration continues in FY11 with \$529 million to provide a High Altitude-Long Endurance Unmanned Aircraft System designed to provide persistent maritime ISR of nearly all the world's high density sea lanes, littorals and areas of national interest. Envisioned as an unmanned adjunct to the P-8A and crucial to the recapitalization of the Navy's airborne maritime ISR capability, the system will seek to leverage Maritime Patrol and Reconnaissance Force (MPRF) manpower, training and maintenance efficiencies.

The MH-60R replaces the aging SH-60B and SH-60F helicopters, whose primary mission areas are undersea warfare and surface warfare. This platform will have numerous capability improvements including airborne low frequency sonar, multi-mode radar, electronic support measures, and a forward looking infrared sensor.

To get a better perspective on the significant transition going on in Naval Aviation Undersea Warfare platforms go to the Naval Aviation Enterprise Web site to download a public release copy of the recently released "Naval Aviation Plan January 2010" (<http://nae.ahf.nmci.navy.mil>).

Other maturing focus areas having an affect on airborne USW are Maritime Domain Awareness and Intelligence, Surveillance, Reconnaissance

and Targeting (ISR&T). Although not pure by USW, both concepts continue to shape the requirement and budget for airborne capability. Concerns are being raised about potential lack of hardcore USW training and the ability to maintain warfighting proficiency with the airborne USW communities spending most of their time operating over land.

The Maritime Patrol and Reconnaissance community is studying sensor placement accuracy, integration, high-altitude atmospheric, high-altitude weapons release and maneuvering, RFI mitigation and GPS jamming. The future of successful airborne USW depends on having both acoustic and non-acoustic wartime skill levels available on a sustained basis. It will also rely on a sophisticated network to link potential wide area sensor fields and

dissimilar platforms together for a "common operating picture." This is an area where perhaps the committee could add some value in helping the Navy determine if the appropriate requirement and acquisition programs are in place to ensure the art form of USW warfare is maintained in an environment where most of the operational time is spent over land.

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.

"In his budget rollout statement SECNAV stated the ability to operate freely at sea is one of the most important elements of joint and interagency operations."



Undersea Command, Control, Communications, and Combat Systems Committee

PAUL K. ROSBOLT, CHAIRMAN
 DR. BOB ZARNICH, DEPUTY CHAIRMAN
 CAPT CHARLES DAVIS (PEO IWS5), NAVY LIAISON
 CAPT ROBERT PARKER (PMW 120), NAVY LIAISON



Greetings all! I am looking out at the piles of snow outside my Crystal City office and looking forward to our Spring Conference! We have another impressive line-up of technical speakers. The technical session will be organized into three distinct focus areas:

Wednesday AM

Program Office updates and overall systems engineering

Wednesday PM

External communications and architectures

Thursday AM

USW DSS and related technologies

Our committee meeting will be held at the conference hotel on Monday afternoon. We will be finalizing our study topic and study organization, as well as looking for ways to make the committee more useful to our membership. Come join us!

A word from our Committee Liaison CAPT Charles Davis, PEO IWS5

The ASW mission area is reaping the benefits of strengthening communications and exchanging lessons learned between the ASW Community of Interest (COI) and Maritime Patrol Reconnaissance Force (MPRF), METOC, MASINT and Command and Control COIs to improve DoD level net-centricity. We are issuing our second version of the ASW COI Data Model (ACDM), aligning IWS 5 system architectures with the PEO IWS Objective Architecture, and

“Industry’s commitment to Navy goals is key, via introduction of innovative ideas and commitment to Navy Open Architecture principles and assisting with adherence to a common data strategy to upgrade and/or replace ‘stove-piped’ ASW systems.”

incorporating “Naval Open Architecture Guidebook” recommendations into production contracts. This enables system designers and developers to share the Navy’s goals at

the earliest stages of design. We have worked with PEO SUB on alignment of architectures and facilitating software reuse; initiated joint Data Management Working Group (DMWG) meetings with the newly formed MPRF COI on data and software reuse opportunities; continued planning with RDA CHSENG on ASW Mission Area Systems Engineering; and continued meetings with the Mine Warfare COI regarding reuse and commonality opportunities.

Full investment in an integrated ASW capability will require continued dedication to: developing common sensors (MFTA); common software (passive, active MF-HF); common processes (submarine APB, surface ACB); a common ASW data strategy (via the ASW COI Data Management Working Group); common IEMP (Integrated Engineering Measurement Program) to provide input to development processes; investment decisions, modeling and assessments; and finally, continuous investment in fully achieving an ASW Common Tactical Picture (USW DSS).

Industry’s commitment to Navy goals is key, via introduction of innovative ideas and commitment to Navy Open Architecture principles and assisting with adherence to a common data strategy to upgrade and/or replace ‘stove-piped’ ASW systems.

Undersea Vehicles Committee

CONTINUED FROM PAGE 7

U.S. Navy Needs Industry’s Help Identifying Technologies for Insertion

With the rapid acceleration in technology advances, the Navy needs industry to provide inputs on emerging technologies that can be used for effective spiral improvements to fielded systems. The rapid commercial-off-the-shelf (COTS) technology insertion methodologies that have worked so well in Navy submarine acoustic systems programs are being adopted by many other Navy programs. Their success, however, is largely dependent on industry identifying those COTS technologies that have the right technical maturity and can satisfy unique government performance parameters to

be quickly and effectively inserted into fielded systems to gain affordable improvements in performance. The NDIA Undersea Warfare Vehicles Technical Committee will continue to work, as it has done on its recent technology study, to provide the Navy assessments on new technologies on a continuing basis. Please contact Jeff Smith (jsmith@bluefinrobotics.com) for more information.

If you are not on our e-mail list for our USW Vehicles e-Blasts that provide periodic updates about our technical area, please contact Rich Talipsky (rtalipsky@seacorp.com) to get on the list.

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Spring Undersea Warfare Division Conference: March 9-11, 2010



WAYNE JAKUBOWSKI, SPRING CONFERENCE CHAIRMAN

A diversified line-up of speakers has been arranged for this year's Undersea Warfare Division Spring Conference with the theme of "Undersea Superiority – Realities, Challenges, and Opportunities." New this year are briefings from the Commander, Navy Warfare Development Command, Commander Naval Special Warfare Group 3, The Naval Postgraduate School (emphasis on related studies), and the Commander Naval Surface Warfare Center.

To fully appreciate the wide spectrum of perspectives related to Undersea Warfare, these speakers will add their focus areas to those normally presented.

In addition to the additional perspectives from our new command presenters, our host RADM Frank Drennan and his Naval Mine and ASW Command, will welcome perspectives from Third Fleet, OPNAV N87, SUBPAC, PEO LMW, NUWC, PEO SUB, ONI and SPAWAR. This combination of presentations will be challenged with covering the full breadth of the critical undersea warfare mission area. To supplement this, Tuesday's March 9 plenary session is followed by a series of technical sessions all easily attended within the Admiral Kidd Conference Center in San Diego, CA.

This year's classified conference will include technical tracts that include: Aviation USW, C4I & 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 attendees from the Hyatt Regency Islandia to the Admiral Kidd Conference Center each day and the dress code is business casual (slacks, collared shirts, NO ties) for industry and khaki for military. Casual attire is appropriate for our continuing and very popular Mongolian barbecue to be held Tuesday evening at the Hyatt immediately following the plenary session. Attendees clearly indicate that they are hoping the East Coast Clam Bake can, at some point, come close to the fantastic cuisine offered here.

We look forward to a professionally rewarding conference, great weather, and both plenary and technical sessions that push our thinking and create ideas to solve challenges of the Undersea Warfare domain.

Raytheon Integrated Defense Systems

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NDIA UWD NEWSLETTER

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