

2018 JOINT UNDERSEA WARFARE TECHNOLOGY SPRING CONFERENCE

THE USW FORCE THE NATION NEEDS: DISTRIBUTED, NETTED,
CAPABLE, AGILE



March 12 – 14, 2018

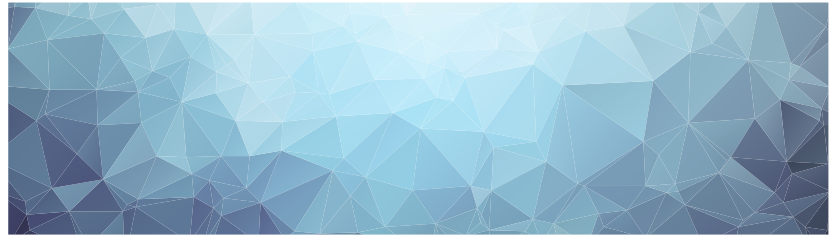
Admiral Kidd Conference Center

San Diego, CA

NDIA.org/undersea-warfare-spring

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WHO WE ARE

The National Defense Industrial Association is the trusted leader in defense and national security associations. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA's membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. For more information, visit NDIA.org

SCHEDULE AT A GLANCE

MONDAY, MARCH 12

Registration Open

Courtyard by Marriott Liberty Station,
Foyer
5:00 – 6:30 pm

Welcome Reception

Courtyard by Marriott Liberty Station,
Waterside
5:00 – 6:30 pm

TUESDAY, MARCH 13

Registration Open

Admiral Kidd Conference Center, Lobby
7:00 am – 5:00 pm

Networking Breakfast

Admiral Kidd Conference Center, Lawn
7:00 – 8:00 am

General Session

Admiral Kidd Conference Center,
Skyline Room
8:00 am – 5:00 pm

Networking Reception

Admiral Kidd Conference Center, Lawn
5:00 – 7:00 pm

WEDNESDAY, MARCH 14

Registration Open

Admiral Kidd Conference Center, Lobby
7:00 am – 5:00 pm

Networking Breakfast

Admiral Kidd Conference Center, Lawn
7:00 – 8:00 am

Technical Sessions

Admiral Kidd Conference Center
8:00 am – 5:00 pm

Aviation/Mine Warfare – Pt Loma Room

C4I – Nimitz Room

*Combat Systems/Warfighter Performance
– Harbor Lounge*

Undersea Sensors – Skyline Room

Undersea Vehicles – San Diego Room



UNDERSEA WARFARE DIVISION

WHO WE ARE

NDIA's Undersea Warfare Division fosters the exchange between government and industry of technical information and expansion of research and development in areas related to undersea warfare. To this end, the division furthers communication by providing a variety of ways for government and industry to work together to solve problems, identify affordable solutions and meet specific requirements. The group also supports both government and industry with advice on undersea warfare policies and acquisition planning.

LEADERSHIP AND COMMITTEES

Michael Tucker

Division Chairman

John Holmes

Conference Co-chairman

Andy Wilde

Conference Co-chairman

Glen Sharpe

Aviation Chairman

Paul Rosbolt

C4I & Combat Systems Chairman

Jon Tobias

Mine Warfare Chairman

Mike Janik

Undersea Sensors Chairman

Tom Ruzic

Undersea Vehicles Co-chairman

Bob Zarnich

Warfighter Performance Chairman

EVENT INFORMATION

EVENT WEBSITE

NDIA.org/undersea-warfare-spring

EVENT CONTACT

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EVENT THEME

The USW Force the Nation Needs: Distributed, Netted, Capable, Agile

SURVEY AND PARTICIPANT LIST

A survey and list of attendees (name and organization only) will be e-mailed to you after the meeting. NDIA would appreciate your time in completing the survey to help make our event even more successful in the future.

SPEAKER GIFTS

In lieu of speaker gifts, a donation is being made to the Fisher House Foundation.

HARASSMENT STATEMENT

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.

BUS SCHEDULE

Due to heightened security measures, it is in your best interest to take the shuttle buses provided. The use of POV is strongly discouraged and may result in entry delays and the risk of not being allowed access. The Admiral Kidd Conference Center is within walking distance (5 minutes) of the Courtyard by Marriott Liberty Station, but credentials are required to access the base at the gate or security office.

TUESDAY, MARCH 13

6:30 AM - 8:30 AM

Bus will shuttle (as filled) from the Courtyard by Marriott Liberty Station & Holiday Inn Bayside to the Admiral Kidd Conference (AKC) Center.

11:00 AM - 4:00 PM

Shuttle bus departs the AKC Center for the Courtyard by Marriott Liberty Station & Holiday Inn Bayside. Shuttle will depart at 11:00, 12:00, 1:00, 2:00, 3:00, and 4:00.

4:45 PM - 6:00 PM

Bus will shuttle as filled from the Admiral Kidd Conference Center to the Courtyard by Marriott Liberty Station & Holiday Inn Bayside.

6:00 PM - 7:30 PM

Bus will shuttle from the Admiral Kidd Conference Center to the Courtyard by Marriott Liberty Station & Holiday Inn Bayside. Drop-offs only.

WEDNESDAY, MARCH 14

6:30 AM - 8:30 AM

Bus will shuttle (as filled) from the Courtyard by Marriott Liberty Station & Holiday Inn Bayside to the Admiral Kidd Conference (AKC) Center.

11:00 AM - 3:00 PM

Shuttle bus departs the AKC Center for the Courtyard by Marriott Liberty Station & Holiday Inn Bayside. Shuttle will depart at 11:00, 12:00, 1:00, 2:00, and 3:00.

4:00 PM - 5:30 PM

Bus will shuttle from the Admiral Kidd Conference Center to the Courtyard by Marriott Liberty Station & Holiday Inn Bayside. Drop-offs only.

SECURITY

For security purposes, we respectfully ask that you check any personal items (luggage, computer bags, coats, etc.) with your hotel bellman, or leave them at your hotel. On-site at the conference, you must carry a valid photo ID with you at all times. Conference badges are to be worn at all times during event. Due to the classified meeting all electronics, blue-tooth enabled, mobile devices, smart watches, writing materials and note taking of the sessions are prohibited.

No badge = no access to ANY event venues.

CAB SERVICES

American Cab – (619) 234-1111

American Express, Visa, and Mastercard

Silver Cab – (619) 280-5555

American Express, Visa, MasterCard, and Discover

Flat Rate (normally 10% lower than meter price); ask the Flat rate price when you book (Meter will be running) You will get the lower of the two prices Meter/Flat rate.

AGENDA

TUESDAY, MARCH 13

7:00 am – 5:00 pm

REGISTRATION OPEN

LOBBY

7:00 – 8:15 am

NETWORKING BREAKFAST

LAWN

8:15 – 8:20 am

CALL TO ORDER

SKYLINE ROOM

Mike Tucker

Chairman, NDIA Undersea Warfare Division

8:20 – 8:25 am

WELCOMING REMARKS

SKYLINE ROOM

RDML Moises Deltoro

Commander, Naval Undersea Warfare Center

8:25 – 8:30 am

INTRODUCTION OF SPEAKERS

SKYLINE ROOM

John Holmes

Chairman, Spring NDIA Joint USW Technology Conference

8:30 – 9:00 am

VADM William Merz

Deputy Chief of Naval Operations for Warfare Systems, N9

9:00 – 9:30 am

RADM John Tammen

Director, Submarine Warfare Division, N97

9:30 – 10:00 am

RADM Daryl Caudle

Commander, Submarine Force, U.S. Pacific Fleet

10:00 – 10:30 am

NETWORKING BREAK

LAWN

10:30 – 11:00 am

SPEAKERS

SKYLINE ROOM

Jerry Ferguson

Deputy Commander, Undersea Warfare Development Center

11:00 – 11:30 am	RDML John Wade Commander, Naval Surface and Mine Warfighting Development Center
11:30 am – 12:00 pm	CAPT Steve Mack Commander, Submarine Development Squadron FIVE
12:00 – 12:15 pm	AWARD CEREMONY SKYLINE ROOM
12:15 – 1:30 pm	NETWORKING LUNCH LAWN
1:30 pm	INTRODUCTION OF SPEAKERS SKYLINE ROOM Andrew Wilde Co-Chairman, Spring NDIA Joint USW Technology Conference
1:30 – 2:05	Craig Shelden Office of Naval Intelligence, Senior Research Analyst
2:05 – 2:40 pm	RADM John Neagley Program Executive Officer for Littoral Combat Ships
2:40 – 3:15 pm	CAPT Doug Belvin Program Manager, Air ASW Systems, PMA-264
3:15 – 3:45 pm	NETWORKING BREAK LAWN
3:45 – 4:20 pm	SPEAKERS SKYLINE ROOM George Drakeley Executive Director for PEO Submarines
4:20 – 4:55 pm	RDML Moises Deltoro Commander, Naval Undersea Warfare Center
4:55 – 5:00 pm	CLOSING REMARKS SKYLINE ROOM
5:00 – 7:00 pm	NETWORKING RECEPTION LAWN

TECHNICAL SESSION ABSTRACT

WEDNESDAY, MARCH 14

SESSION		8:00 am	8:30 am	9:00 am	9:30 am	10 am
C4I Session Chair: Paul Rosbott	Nimitz Room	20405 'What can the Undersea Communications & Integration Program Office do for you? CAPT Michael J. Boone	20299 Secure, Mobile Data Management enabling the Warfighter Dr. Gregg Gardner Mark Donovan	20363 Undersea Data & Power Network – Test Bed Bill Traganza	20419 Undersea Warfare Decision Support System (USW DSS) Robert D. Schmidt	Break
Combat Systems / WP Session Chairs: Dr. Bob Zarnich	Harbor Lounge	20417 IWS5 Update Lee Agin	20409 Task-based approach to modernization training of the AN/SQQ-89A(V)15 Dr. Harvey S. Smallman	20389 STRATUS: High Velocity Training for the Modern Warfighter Mike Miller	20339 Security Automation and Orchestration (the path to Machine Learning and Artificial Intelligence) Timothy T. Lunderman	Break
Mine Warfare / Aviation Session Chair: Jon Tobias & Glen Sharpe	Pt Loma Room	20413 Update: Single Sortie Detect to Engage Mine Dr. Kerry Commander	20392 Seabed Warfare & XL UUV, MCM After LCS & EOD UUV's RDML Rick Williams, USN	20316 Surface Fleet Underwater Electric potential (UEP) Requirements, Signatures, Susceptibility Jessica McElman	20291 Airborne Standoff Counter Mine and USW Mission Sensors Richard D. Sterc	Break
Undersea Sensors Session Chair: Mike Janik	Skyline Room	20354 Seabed Surveillance Systems – Modernization Priorities Bill Traganza	20404 Acoustic Vector Sensors for Undersea Surveillance Dr. Clayton M. Bjorland	20420 Advanced Development Status Peter Scala	20331 PMS 485's Deployable Family of Systems (DFoS) Program of Record John E. Curtis	Break
Undersea Vehicles Session Chair: Tom Ruzic & Chuck Fralick	San Diego Room	20427 Undersea Weapons Programs Update CAPT Steven Harrison, USN		20447 Unmanned Undersea Vehicle Squadron ONE - A Year in Review CDR Scott Smith, USN		Break

SESSION		10:30 am	11:00 am	11:30 am	12 pm	1:00 pm
C4I Session Chair: Paul Rosbolt	Nimitz Room	20407 System Architecture for an Autonomous TASW Mission Package for Unmanned Surface Vessels LCDR Paul K. Evans , USN	20366 Wide Ocean Network Realization through Undersea Design and Integration Facility Collaboration Kenneth B. Tysinger	OPEN	Lunch	20422 Underwater and Air C5ISR Using Free Space Optical Technology CAPT Tom Dlugolecki (Ret), USN Presented by Dr. Michael Solonenko
Combat Systems / WP Session Chairs: Dr. Bob Zarnich	Harbor Lounge	20410 Virtualization Technology Applications in Surface USW Combat Systems Training Jamie M. Burris	20443 Submarine Combat Systems - Submarine Launched Unmanned Aerial Systems (SLUAS) CAPT Noel Gonzalez, USN	20371 Advancing Heterogeneous Combat System and C4I Systems Data Exchanges with the Universal Gateway Matthew Fisher	Lunch	ONI 4 Russian USW Tactics
Mine Warfare / Aviation Session Chair: Jon Tobias & Glen Sharpe	Pt Loma Room	20454 Smart Mining Sheila Schnoering	20472 NSWC PCD Chief Technology Officer Dave Everhart	20486 Paths To Improving Mine Counter Measures Capability Mark Rios	Lunch	20337 The Next Generation of Ammunition of Supercavitating MEA™ (Multi Environment Ammunition) utilizing patented Cav-X™ technology Jon A. Garber
Undersea Sensors Session Chair: Mike Janik	Skyline Room	20408 Next Generation Undersea System for Detection of Nuclear Explosions Joshua Henson Dallas Meggitt	20396 Passive Characterization of Ocean Environment Using Ambient Noise Robert Taylor	20394 Advances in Flexural Disk Transducers for ASW Applications Dr. James A McConnell	Lunch	20344 AN/SQQ89 ASW Advanced Development Improvements Ryan T. Moore
Undersea Vehicles Session Chair: Tom Ruzic & Chuck Fralick	San Diego Room	20393 Tactical Submarine Evolution Plan CDR Scott McGinnis, USN	20412 SOF Undersea Mobility Program Update CAPT John P. Newton, Jr, USN	20442 Leidos Autonomous Intelligence Preparation of the Environment (IPOE) from a Combined USV/UUV System - ANT-X 2017 Results E.C. Helme	Lunch	20416 U.S. Navy Submarine Rescue Program CAPT Rob Wolf, USN

SESSION		1:30 pm	2:00 pm	2:30 pm	3 pm	3:30 pm
C4I Session Chair: Paul Rosbolt	Nimitz Room	20423 Undersea Optical-GPS (Global Positioning System) CAPT Tom Dlugolecki (Ret), USN Presented by Dr. Jim Menders	20332 Network Virtualization for Navy afloat and airborne platforms Mark Mitchiner	20340 Converged and Hyperconverged Solutions for the US Navy Dave Alexander	Break	20377 Small Form Factor Link 16 Terminal: TTR Douglas Henderson
Combat Systems / WP Session Chairs: Dr. Bob Zarnich	Harbor Lounge	ONI 4 Russian USW Tactics	ONI 6 Chinese Submarine Operations	20473 SSCPAC Todd Webber	Break	20452 Sea Scout: Air Launchable UUV Gregory Folts
Mine Warfare / Aviation Session Chair: Jon Tobias & Glen Sharpe	Pt Loma Room	20333 Air ASW Systems Status and Roadmap CAPT Doug Belvin, USN		20338 Introducing the A-size Electro-Acoustic Sonobuoy (AKA: EA Buoy) – Now and the Future Dr. Jeffrey Ridgway	Break	20460 ONR's Extended Range DiFAR Project Tracey A Fischer
Undersea Sensors Session Chair: Mike Janik	Skyline Room	20415 Emerging multi-static capability for USN surface combatants Meg Stout	20406 Avoiding Catastrophes: Worst-Case Optimization with Applications to Multistatic Active Sonar Arrays Thomas Powers	ONI 2 Underwater Wireless Sensor Networks	Break	20397 Development of the Mobile Off- board Clandestine Communications and Approach (MOCCA) – Progress Status Jason W. Osborn David Herold
Undersea Vehicles Session Chair: Tom Ruzic & Chuck Frailek	San Diego Room	20306 Highly Rate Sensitive Polymers in the Design of Underwater Vehicles Rosdhy G. Barsoum	20431 A Study of effects of alternative double-hull designs on acoustic radiation in the 20-200Hz range Dr. Jeffrey L. Cipolla	20402 Common Submarine Coordinated Asset Planner for Engagement (C-SCAPE): Integrated Planning and Execution for Submarine Deployed Unmanned Vehicles Darren Powell	Break	ONI 3 Chinese Submarines

SESSION		4:00 pm	4:30 pm	5 pm
C4I Session Chair: Paul Rosbalt	Nimitz Room	20399 Modeling and Testing an Innovative, Density-Tunable Fiber Optic Micro-Cable Donna M. Kocak	20453 DOLPHIN LPI/LPD Full Duplex Acoustic Comms at Sea Testing Gregory Folts	Conference Adjourns
Combat Systems / WP Session Chairs: Dr. Bob Zarnich	Harbor Lounge	20342 PEZ UUV Harry Lichter	No Session	Conference Adjourns
Mine Warfare / Aviation Session Chair: Jon Tobias & Glen Sharpe	Pt Loma Room	ONI 1 Artificial Intelligence for Undersea Warfare	No Session	Conference Adjourns
Undersea Sensors Session Chair: Mike Janik	Skyline Room	20334 High-Search Rate Off-board Transducer for Mobile Off-board Clandestine Communications and Approach (HOT MOCCA) Andrew Coon	20414 μSAS Sonar System Integration with Iver3 AUV Kevin Claycomb	Conference Adjourns
Undersea Vehicles Session Chair: Tom Ruzic & Chuck Fralick	San Diego Room	20335 Repurposing Existing Military Hardware: The MK39 EMATT Russell Sylvia	ONI 5 ONI Support for Acquisition	Conference Adjourns

The NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members: prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.

SESSION ABSTRACT DESCRIPTIONS

AIRBORNE STANDOFF COUNTER MINE AND USW MISSION SENSORS

20291

SYERS and MS-177 Family of Systems (FoS) sensors application in standoff counter mine and ASW mission sets.

SECURE, MOBILE DATA MANAGEMENT ENABLING THE WARFIGHTER

20299

NetApp's Data Fabric technology is the key enabler to ensure the near real time, secure data availability and flow from the sensor edge of the battle space through the Navy's global networks to where the data is needed most, the mission analysts and battle commanders.

HIGHLY RATE SENSITIVE POLYMERS IN THE DESIGN OF UNDERWATER VEHICLES

20306

Use of highly rate sensitive polymers can augment the pressure resistance of shells made of high strength materials with lower levels of ductility. Tests will be undertaken to develop design parameters for this application. Benefits for mitigating implosion generated pulse are also anticipated.

SURFACE FLEET UNDERWATER ELECTRIC POTENTIAL (UEP) REQUIREMENTS, SIGNATURES, AND SUSCEPTIBILITY

20316

Surface ship analytical signature models and underwater electric potential (UEP) speculative mine model results are used to understand the impact of quieting technologies on UEP signature, susceptibility, and maneuver area for multiple surface ship classes in areas of interest.

PMS 485'S DEPLOYABLE FAMILY OF SYSTEMS (DFOS) PROGRAM OF RECORD

20331

This brief details the current activities that DSG is managing and its plans for a future Deployable Family of Systems (DFoS) to support rapid prototyping and production of surveillance systems that are directly focused on meeting gaps in FSS and SURTASS missions.

NETWORK VIRTUALIZATION FOR NAVY AFLOAT AND AIRBORNE PLATFORMS

20332

Network Virtualization provides significant enhancement of agility and capability for afloat and airborne platforms. Software based capabilities instead of dedicated hardware appliances offer great potential for reduced Space, Weight and Power as well as reduced total lifecycle cost and design agility.

AIR ASW SYSTEMS STATUS AND ROADMAP

20333

Air ASW requires high volume production of current sensors, and technology development for increased future capability. PMA-264 will provide an update on current production and research efforts, and guidance on future direction via a program roadmap update

HIGH-SEARCH RATE OFF-BOARD TRANSDUCER FOR MOBILE OFF-BOARD CLANDESTINE COMMUNICATIONS AND APPROACH (HOT MOCCA)

20334

STR is teamed with the University of Washington to realize a High-Search Rate Off-board Transducer (HOT) for DARPA's Mobile Off-board Clandestine Communications and Approach (MOCCA) program. The MOCCA program seeks to offset the risk of submarine-on-submarine engagement reliant on diminishing passive sonar ranges through active sonar. This presentation updates status for the HOT MOCCA effort where testing last Fall showed the feasibility of core spatially dependent processing gains required for the concept to work.

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REPURPOSING EXISTING MILITARY HARDWARE: THE MK39 EMATT

20335

This paper describes cost effective methods used to repurpose a single platform designed for a single mission. The MK39 EMATT is a low cost unmanned underwater vehicle designed for a single mission. Three different repurpose options are described which maintain its ASW features while allowing it to perform multiple missions.

WIDE OCEAN NETWORK REALIZATION THROUGH UNDERSEA DESIGN AND INTEGRATION FACILITY COLLABORATION

20336

General Dynamics recently completed a multi-year project to stand up an Undersea Design and Integration Facility (UDIF) at our McLeansville, NC location. Our UDIF provides an environment for the integration of new undersea network technologies into a Wide Ocean Network. We welcome opportunities to collaborate with government and industry to reduce program risk through early land-based integration and test in the UDIF.

THE NEXT GENERATION OF AMMUNITION SUPERCAVITATING MEA™ (MULTI ENVIRONMENT AMMUNITION) UTILIZING PATENTED CAV-X™ TECHNOLOGY

20337

Based on a phenomenon known as 'supercavitation', MEA bullets work in air and water, with extended range in air, improved armor and material penetration, even at low angles and delivering increased stopping power compared to conventional ammunition.

INTRODUCING THE A-SIZE ELECTRO- ACOUSTIC SONOBUOY (AKA: EA BUOY) – NOW AND THE FUTURE

20338

The EA Buoy (SSQ-53F (XN-3)) is an electro-acoustic buoy that combines an E-field sensor system with a standard Q-53G sonobuoy. This design enhances the passive detection capabilities of the Q53G by providing E-field data simultaneously with the acoustic data.

SECURITY AUTOMATION AND ORCHESTRATION (THE PATH TO MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

20339

Machine learning and Artificial intelligence are the "latest" craze within systems and network technology fields. Tuning USN systems to utilize ML and AI to improve Cyber Security is not easy, but can be accomplished utilizing frameworks familiar with warfighters – the Observe, Orient, Decide and Act (OODA) loop.

CONVERGED AND HYPERCONVERGED SOLUTIONS FOR THE US NAVY

20340

HyperConverged Infrastructure is a new approach to data center architecture that could hold benefits for the US Navy in both afloat and undersea applications. Understanding this new technology will be key to architecting next generation data center solutions.

PEZ UUV

20342

PEZ is a new class of UUV designed for ease of deployment, minimal cost, and dramatically reduced logistics. The flat disk shape of the PEZ UUV allows 15x to be stacked in a PEZ Dispenser placed in a vertical tube on a SSGN or SSN with Virginia Payload Module (VPM). The PEZ UUVs can be released one at a time or all at once to form a swarm or a team with dedicated roles.

AN/SQQ89 ASW ADVANCED DEVELOPMENT IMPROVEMENTS

20344

PEO-IWS5 is the advanced development/production/installation/ILS office for US Navy surface ship Anti-Submarine Warfare (ASW) systems. This brief will be an overview of the surface ship ASW portfolio within PEO-IWS5 including focus areas for industry participation.

SEABED SURVEILLANCE SYSTEMS – MODERNIZATION PRIORITIES

20354

The presentation will include, but not be limited to the following areas of focus:

- Identifying issues in the IUSS/FSS component that need to be solved (capability gaps) to improve future robustness of IUSS/FSS capability, with accompanying operational vignettes help provide clarity.
- Current and future opportunities for industry partners to participate in PMS-485 FSS challenges and solicitations.
- Description of the current and near term fiscal and resourcing environment.

UNDERSEA DATA & POWER NETWORK – TEST BED

20363

PMS-485 Maritime Surveillance Systems (MSS) is developing a test bed consisting of a seabed-laid data and power distributed cabled network system. Their goal is to advance the development of undersea devices (e.g., UUV docking stations, acoustic comms modems, laser comms, bouys with RF comms, sensor, etc.) that would potentially take advantage of a common undersea access point and network infrastructure. This test bed will reduce at-sea cost, rapidly test undersea devices, and promote competition. In addition, PMS-485 needs help from industry, academia, and government labs to evolve and improve upon the test bed to evolve it into an operational system.

ADVANCING HETEROGENEOUS COMBAT SYSTEM AND C4I SYSTEMS DATA EXCHANGES WITH THE UNIVERSAL GATEWAY

20371

Discussion of the 2016/2017 Data Dissemination and Transformation Service (DDTS) Technology Evaluation & Demonstration (TED). Talk includes architectural overview, quantitative findings, operational significance, challenges and next steps for the Universal Gateway.

SMALL FORM FACTOR LINK 16: TACNET TACTICAL RADIO OVERVIEW

20377

Warfighters and DLS saw the need for a Small Form Factor (SFF) Link 16 terminal for L16 disadvantaged platforms; development considerations included:

Harsh tactical environments, Platform restrictions and limitations of these users.

TTR was derived from proven operational technologies: ARC-210 Radio (40,000+ fielded; 22+ years in the market) and the TacNet WDL Terminal (2,000+ fielded; 8+ years in the market)

TTR was built with the Warfighter and the Integrator in mind for Capabilities and Performance: Ease of Integration, Ease of Operation, Link 16 (Current and Future Contested Environments)

STRATUS: HIGH VELOCITY TRAINING FOR THE MODERN WARFIGHTER

20389

The undersea warfare force must become distributed, netted, capable, and agile to combat an ever-evolving enemy. However, for every new technology developed with that goal, there is an equally important requirement to train the warfighter on how to implement it. The difficulty with this training requirement is that new technology must make its way to the deployed battlespace far more quickly than ever before. The technologies of the Submarine Training and Tactics Unified Schoolhouse (STRATUS) are the key to reaching our extended warfighters and providing them the tools they need to dominate the battlefield.

SEABED WARFARE & XLUUV, MCM AFTER LCS, & EOD UUV'S

20392

Overview of NPS Thesis Equivalent Projects in 2017 & 2018 with MIW interest or applications. - "Mine Warfare after LCS"; "Next Generation MIW UUV's"; "Project Leviathan - SEABED WARFARE & XLUUV"; "A Cost Effectiveness Analysis for Sensors for Expeditionary MCM UUV's"

TACTICAL SUBMARINE EVOLUTION PLAN

20393

The TSEP is a scalable, enduring process for developing and fielding undersea capabilities while continually ensuring alignment with strategic guidance.

ADVANCES IN FLEXURAL DISK TRANSDUCERS FOR ASW APPLICATIONS

20394

Two different flexural disk applications are presented which show advances over the state-of-the-art in underwater acoustic transduction for ASW applications. The first application shows how the mutual radiation impedance can create a low-frequency multi-modal device having two principal frequencies of operation. The second application shows how a flexural disk transducer can be used to facilitate transmit/receive capability for the submarine large vertical array.

PASSIVE CHARACTERIZATION OF OCEAN ENVIRONMENT USING AMBIENT NOISE

20396

This presentation will discuss how acoustic sensors on the submarine can be used to infer information about the ocean sound speed profile (SSP), wind speed, and bottom characteristics. The data from Passive MF sensors are being used to develop these methods for use in future STDA algorithms, as well as signal processing algorithms.

DEVELOPMENT OF THE MOBILE OFF-BOARD CLANDESTINE COMMUNICATIONS AND APPROACH (MOCCA) – PROGRESS STATUS

20397

The DARPA MOCCA program is developing an active sonar solution that mitigates the limits of passive submarine sonar sensors. The objective is to achieve significant stand-off detection and tracking range through the use of a submarine deployed UUV acting as an offboard, bistatic illuminator while the submarine remains passive as the bistatic receiver. The submarine will need to be able to control the UUV while minimizing blue submarine counter-detection.

MODELING AND TESTING AN INNOVATIVE, DENSITY-TUNABLE FIBER OPTIC MICRO-CABLE

20399

This presentation introduces analytical model and test results of a small diameter, lightweight, buoyant (tunable to a desired specific gravity), unpowered fiber optic cable (micro-cable) capable of surviving deployment and operation in the harsh ocean environment for at least 30 days. The micro-cable was designed for the DARPA Tactical Undersea Network Architecture (TUNA) program (Phases 1 and 2), to integrate a military tactical data network with a rapidly deployable temporary undersea network. However, because the design is modular and easily changed, this cable is relevant to many other strategically important undersea applications. Having the ability to fully predict and test the performance of various designs of the micro-cable prior to manufacturing large quantities and deploying the cable in the ocean dramatically reduces costs and increases the likelihood of a successful mission.

COMMON SUBMARINE COORDINATED ASSET PLANNER FOR ENGAGEMENT (C-SCAPE): INTEGRATED PLANNING AND EXECUTION FOR SUBMARINE DEPLOYED UNMANNED VEHICLES

20402

Common Submarine Coordinated Asset Planner for Engagement (C-SCAPE) is an extensible software system that will provide an integrated planning capability to the Submarine Payload Control System (PCS). C-SCAPE will support the collaborative planning, coordination, briefing, and execution for unmanned vehicles (UxVs) deployed from a submarine.

COMMON SUBMARINE COORDINATED ASSET PLANNER FOR ENGAGEMENT (C-SCAPE): INTEGRATED PLANNING AND EXECUTION FOR SUBMARINE DEPLOYED UNMANNED VEHICLES

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ACOUSTIC VECTOR SENSORS FOR UNDERSEA SURVEILLANCE

20404

Acoustic vector sensors have the potential to improve future undersea surveillance capabilities. Measured data from prototype vector-sensor arrays was analyzed to evaluate the technology for quiet-target detection.

WHAT CAN THE UNDERSEA COMMUNICATIONS & INTEGRATION PROGRAM OFFICE DO FOR YOU?

20405

The Undersea Communications & Integration Program Office (PMW 770) delivers integrated and interoperable C4I capabilities by creating, connecting, and maintaining communication infrastructures for manned/unmanned undersea systems and associated shore sites to support the Navy. PMW 770 meets its unique and challenging mission by integrating products from partner Program Offices to provide C4I System-of-Systems communication architectures to the warfighter. PMW 770 not only develops undersea communication systems, but also performs communication system hardware and software integration, modernization, and sustainment.

AVOIDING CATASTROPHES: WORST-CASE OPTIMIZATION WITH APPLICATIONS TO MULTISTATIC ACTIVE SONAR ARRAYS

20406

Worst-case optimization problems are not only difficult to solve computationally, but failure to solve them can be catastrophic. While some of these problems are impossible to even approximately solve, relaxing the problem slightly allows for near-optimal solutions to be found in polynomial time. An algorithm called Generalized Saturate (GENSAT) is developed and applied to scheduling deep water active sonar arrays for multi-objective multi-target tracking.

SYSTEM ARCHITECTURE FOR AN AUTONOMOUS TASW MISSION PACKAGE FOR UNMANNED SURFACE VESSELS

20407

The development of unmanned surface vessels (USV), such as the Sea Hunter, presents the opportunity to develop a fleet of distributed, netted, capable, and agile ASW platforms that can provide open ocean high volume search for persistent detection and cueing. Unlike unmanned undersea vessels (UUV), USVs provide a unique opportunity for collaborative theater ASW (TASW) using existing communications capabilities. To enable this vision, the Navy requires the development of a system architecture for employment of an autonomous TASW mission package on USVs.

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NEXT GENERATION UNDERSEA SYSTEM FOR DETECTION OF NUCLEAR EXPLOSIONS

20408

This paper describes an advanced, next-generation seafloor sensor system for detection of nuclear explosions, termed the Seismo-Hydroacoustic Data Acquisition System (SHDAS). This system complies with the Comprehensive Test-Ban Treaty Organization seismic and hydroacoustic monitoring and data reporting requirements. The SHDAS includes sixteen seafloor sensor packages that incorporate both geophysical and acoustic sensors. The system was installed successfully in early 2017 in the Eastern Mediterranean.

TASK-BASED APPROACH TO MODERNIZATION TRAINING OF THE AN/SQQ-89A(V)15

20409

ACB modernization training struggles to keep up with changes across builds. What should the new curriculum be for a build, and how should limited training budgets be spent to most effectively train it? A scientifically-principled approach to tackling these challenges is reported.

VIRTUALIZATION TECHNOLOGY APPLICATIONS IN SURFACE USW COMBAT SYSTEMS TRAINING

20410

A technology solution has been developed to support the rapid fielding of AN/SQQ-89A(V)15 USW Combat System variants and enable surface sonar operators to learn on a high-fidelity training system that is representative of the latest A(V)15 variant.

SOF UNDERSEA MOBILITY PROGRAM UPDATE

20412

PMS 399 will discuss upcoming NAVSEA initiatives to better support the integration of manned and unmanned payloads into attack submarines and large ocean interfaces, including the status of the Dry Deck Shelter (DDS) Modernization Program – this program has initiated production in Spring 2018 and will deliver to the fleet by FY20, affording significant improvement in capacity for the Submarine Large Ocean Interface - supporting SOF Divers / clandestine insertion as well as unmanned systems such as LDUUV or LBS-AUV(S). Additionally, PMS 399 will provide a program update on the Mobile Anti-Submarine Training Target (MASTT).

UPDATE: SINGLE SORTIE DETECT TO ENGAGE MINE COUNTERMEASURES

20413

This presentation will provide an overview of the USV Payloads for Single – Sortie Mine Countermeasures (SHD-FY13-07) program that is scheduled to be completed in March, 2018, and a summary on the technologies that were developed to support the Single Sortie MCM concept.

μSAS SONAR SYSTEM INTEGRATION WITH IVER3 AUV

20414

EMERGING MULTI-STATIC CAPABILITY FOR USN SURFACE COMBATANTS

20415

Use of multi-statics (use of spatially separated sources and receivers) has long been a theoretical possibility, but has not been practical when it was not possible to know the location and timing of the source emission. Ms. Stout et al. discuss Fleet observations and S&T advances that may make multi-statics feasible.

U.S. NAVY SUBMARINE RESCUE PROGRAM

20416

The US Navy's submarine escape and rescue program supports US and foreign submarine services, providing needed capability to rescue sailors in the event of a distressed submarine (DISSUB) as demonstrated recently in support of the missing Argentinian submarine ARA SAN JUAN. This presentation will serve to update government and industry partners on the status of our capabilities, current acquisitions and procurements, and to share perspective on future technology objectives.

IWSS UPDATE

20417

Overview of IWS 5.0 programs and their progress.

UNDERSEA WARFARE DECISION SUPPORT SYSTEM (USW DSS)

20419

USW-DSS enables the Anti-Submarine Warfare (ASW) Commander (ASWC) the ability to plan, coordinate, establish, and maintain an undersea Common Tactical Picture (CTP) and execute tactical control. It enables effective planning and execution of USW operations, optimizes placement of sensors for exploitation of the environment, manages available resources, balances operations versus risk, provides a clear vulnerability assessment of the operational environment.

ADVANCED DEVELOPMENT STATUS

20420

Program Executive Office Undersea Systems Advanced Development (PEO IWS5A) delivers improvements to present and future sonar and combat control systems for Navy Submarine and Surface Ships.

SEABED TO SPACE C5ISR USING FREE SPACE OPTICAL TECHNOLOGY

20421

Outlines the Optical technologies which facilitate and improve the ability of USN and Joint Forces to complete Mission and CONOPS requirements from Mine Counter Measures to Time Critical Strike. Shows how sensors, non-kinetic payloads, UxVs, and 3rd party targeting efforts in all physical and warfare domains can be commonly linked and coordinated by advanced C5ISR FSO technologies. Describes the Integration of the Optical Information transport layer across all physical/warfare domains to enable Distributed Lethality, Information Operations, and Electronic Maneuver Warfare strategies/tactics.

UNDERWATER AND AIR C5ISR USING FREE SPACE OPTICAL TECHNOLOGY

20422

This paper focuses on USN and Joint UUV Requirements to communicate at Speed and Depth with other submerged assets and also to platforms in the air. The three C5ISR Modalities described are: Undersea All Through Water (ATW); Air-Water Interface (AWI); and Maritime All through Air (ATA) operational environments. Specific product concepts deployed for Naval Underwater Platforms are described with their associated naval tactic and product implementation.

UNDERSEA OPTICAL-GPS (GLOBAL POSITIONING SYSTEM)

20423

We discuss the development of an underwater Optical-Global Positioning System (Optical-GPS) to enable an underwater terminal to precisely establish its position underwater. Our underwater system concept is analogous to above water GPS, except that the radio signals are replaced by optical pulses in the blue-green seawater window. Like the terrestrial system, position is determined from arrival time differences, avoiding the need to equip receivers with absolute time references.

UNDERSEA WEAPONS PROGRAMS UPDATE

20427

This brief provides an overview of undersea weapons status and plans, to include MK48 heavyweight torpedo, MK54 lightweight torpedo, High Altitude ASW Weapon Capability (HAAWC), Contender, Advanced Lightweight Torpedo, and ASW targets. There will also be a discussion of the revised SW development process that seeks industry involvement.

A STUDY OF EFFECTS OF ALTERNATIVE DOUBLE-HULL DESIGNS ON ACOUSTIC RADIATION IN THE 20-200HZ RANGE

20431

This study compares three submarine hull construction approaches with respect to radiated noise characteristics. Large-scale finite element simulations showed that new types of multihull construction offer promise in signature reduction.

LEIDOS AUTONOMOUS INTELLIGENCE PREPARATION OF THE ENVIRONMENT (IPOE) FROM A COMBINED USV/UUV SYSTEM – ANTX 2017 RESULTS

20442

ANTX 2017 included the first-ever demonstration of a comprehensive, effective, truly autonomous, ocean IPOE solution with COLREGs-based obstacle avoidance. The paper discusses the development and employment of the system.

SUBMARINE COMBAT SYSTEMS – SUBMARINE LAUNCHED UNMANNED AERIAL SYSTEMS (SLUAS)

20443

This brief will focus on the integration of the Submarine Launched

Unmanned Aerial Systems into the Submarine Combat System (AN/BYG-1). I will provide a brief history of Submarine Combat Systems evolution, and then move quickly into how the integration of current and future UAVs will be streamlined. The discussion will cover the steps PMS-425 is taking to allow for quicker fielding of UAVs. I will discuss the current capabilities and limitations, as well as how Industry can contribute to the effort. We will touch on pitfalls, challenges, and how to avoid them. I will provide a solid 15-18 minutes of briefed material and allow for 12-15 minutes of questions and answers. The QA portion is intended to allow for open discussion between Government and Industry, and will hopefully allow for a better understanding of the mission, vision, and help needed to achieve both. The brief material will be unclassified, and the voice over will be up to the secret level.

UNMANNED UNDERSEA VEHICLE SQUADRON ONE – A YEAR IN REVIEW

20447

This brief provides an overview of the squadron's capability, recent unmanned undersea vehicle (UUV) operations, and tactical development. Updates will be provided on the Micro-UUV homing initiative and the efforts supporting Theater Anti-Submarine Warfare using the Transformational Reliable Acoustic Path Systems (TRAPS).

SEA SCOUT: AIR LAUNCHABLE UUV

20452

The Sea Scout UUV is an A-sized/micro UUV that can be launched from any A-sized launcher on aircraft, helo, ship, or even hand launched. Latest development testing will have proven hydrodynamic performance, mission performance, and multi-mode performance. This presentation will present the results of this testing.

DOLPHIN LPI/LPD FULL DUPLEX ACOUSTIC COMMS AT SEA TESTING

20453

Present the results of several at sea tests of DOLPHIN LPI/LPD full duplex acoustic comms and the verification of acoustic comms capability improvements

SMART MINING

20454

Smart Mining is a Rapid Prototyping, Experimentation and Demonstration (RPED) project developed in response to the need for an advanced offensive mining capability described in the USPACOM Advanced Maritime Mining Joint Emerging Operational Needs Statement (JEONS). This project will demonstrate Fleet-valued sensors, communications, and effector technologies integrated into a complete Smart Mining system. RPED events will be used in year one to showcase current technologies' ability to address the end-to-end Mining Mission Thread, while year two will include further integration to fill gaps not addressed in the Mining Mission Thread, participate in a Fleet Exercise, and provide leave-behind system component prototypes.

EXTENDED RANGE DIRECTIONAL FREQUENCY ANALYSIS AND RECORDING SONOBUOY

20460

This presentation will introduce ONR's project to extend the passive detection capability of DIFAR sonobuoys through the exploitation of a unique feature of the sound channel and areas where industry may contribute to this work.

BIOGRAPHIES



CAPT DOUG BELVIN

Program Manager
Air ASW Systems

Captain Doug Belvin attended Duke University via the Naval Reserve Officer Training Corps, graduating in 1993 with a degree in Electrical Engineering. Belvin also earned a post-graduate degree in Technical Management from Johns Hopkins and is a graduate of the U.S. Naval Test Pilot School, class 119.

Following his commissioning and flight training he qualified in the P-3C at NAS Jacksonville FL, and flew operationally with the Skinny Dragons of Patrol Squadron FOUR at NAS Barbers Point, HI. He qualified as a P-3C Patrol Plane

Commander, Functional Check Flight Pilot, Instructor Pilot, and Mission Commander.

Belvin's subsequent flying assignments included tours as an operational and developmental test pilot. During his developmental test tour, he redesignated as an Aerospace Engineering Duty Officer (AEDO).

As an AEDO, Belvin served in a variety of program management assignments in four program office tours, managing programs in a wide variety of stages of the acquisition life cycle, such as developmental source selection, full scale developmental test and evaluation, and post production sustainment. In addition, he completed a tour on the staff

for the Program Executive Officer for Air ASW, Assault, and Special Mission programs, PEO(A). He assumed command as the major program manager for Air ASW Systems, PMA-264, in August 2016.

CAPT Belvin holds Level III Acquisition Certification in Program Management, Systems Planning, Research, Development and Engineering, and Test and Evaluation. He has been selected into the Defense Acquisition Corps and NAVAIR Leadership Development Program. Awards include Meritorious Service Medal, Navy Commendation Medal, Navy Achievement Medal, and various campaign and unit awards.



RADM DARYL CAUDLE

Commander, Submarine Force
U.S. Pacific Fleet

Rear Adm. Daryl Caudle is a native of Winston-Salem, North Carolina,

and graduated from North Carolina State University (magna cum laude) in 1985, where he majored in chemical engineering. He was commissioned after attending Officer Candidate School in Newport, Rhode Island. Caudle holds advanced degrees from the Naval Postgraduate School, Master of Science (distinction) in Physics from Old Dominion University, masters in engineering management and from the School of Advanced Studies, University of Phoenix, where he obtained his Doctor of Management in Organizational Leadership with a specialization in Information Systems and Technology.

His doctoral dissertation research was conducted on military decision making uncertainty regarding the use of force in cyberspace. He is also a licensed professional engineer.

His early sea tours included assignments as division officer, USS George Washington Carver (SSBN 656G); engineer, USS Stonewall Jackson (SSN 634B); engineer, USS Sand Lance (SSN 660); and executive officer, USS Montpelier (SSN 765).

Caudle's first command assignment was as commanding officer of USS Jefferson City (SSN 759). As the deputy commander, Submarine Squadron 11, he served as commanding officer of USS Topeka (SSN 754) and USS Helena (SSN 725) due to emergent losses of the normally assigned commanding officers. He also commanded Submarine Squadron 3.

Tours ashore include assignments as assistant force nuclear power officer, Commander Submarine Force, U.S. Atlantic Fleet; officer-in-charge of Moored Training Ship (MTS635); deputy commander, Submarine Squadron 11; assistant deputy director for information and cyberspace policy on the Joint Staff (J5, strategic plans

and policy) in Washington, D.C.; and chief of staff Commander Submarine Force, U.S. Pacific Fleet.

His other flag assignments include deputy chief for security cooperation, Office of the Defense Representative, Pakistan and deputy commander, Joint Functional Component Command-Global Strike.

Caudle is currently serving as commander, Submarine Force, U.S. Pacific Fleet. He is the principal advisor to the Commander, U.S. Pacific Fleet for submarine matters. Prior to this assignment, he was deputy commander, U.S. 6th Fleet; director of operations U.S. Naval Forces Europe-Africa; and commander, Submarine Group 8.

His personal decorations include the Defense Superior Service Medal (three awards), Legion of Merit (three Awards), Meritorious Service Medal (three Awards), Navy and Marine Corps Commendation Medal (five Awards), and the Navy and Marine Corps Achievement Medal (four Awards).



RDML MOISES DELTORO, III

*Deputy Commander for Undersea Warfare & Commander
Naval Sea Systems Command (SEA07) & Naval Undersea Warfare Center*

Rear Adm. Moises DelToro III, grew up in South Bend, Indiana, and enlisted

in the Navy in 1980. He was commissioned via the University of Utah Navy ROTC program in 1987 with a Bachelor of Science in Mechanical Engineering. He holds a Master of Science in Engineering Management from the Catholic University and a Master of Science in Resourcing National Security Strategy from the Industrial College of the Armed Forces.

His sea tours include command of the USS Rhode Island (SSBN 740 Blue) from March 2005 to March 2008. During this period, the ship was awarded two Battle Efficiency Awards for operational excellence and three Commander-in-Chief, Atlantic Fleet Retention Excellence Awards. DelToro also served as a division officer aboard USS Pittsburgh (SSN 720); engineer officer

aboard USS Maine (SSBN 741 Blue), and executive officer aboard USS Salt Lake City (SSN 716), deploying to the Mediterranean, North Atlantic and Western Pacific, as well as conducting several strategic deterrent patrols.

Ashore he served as Nuclear Propulsion Officer Candidate Program Manager at Navy Recruiting Command, Action Officer on the Joint Staff (J-8), and Non-nuclear Enlisted Community Manager at the Bureau of Personnel.

DelToro also served as executive assistant to the Director, Submarine Warfare (N-97) for one year before entering the Acquisition Professional Community in 2009, where he served in a number of assistant program manager positions. DelToro served as the program manager for Undersea Defensive Warfare Systems from December 2011 to April 2015. During this period the program was awarded a Secretary of the Navy

Excellence in Acquisition Award and a Coalition for Government Procurement Excellence in Partnership Award.

DelToro assumed command of the Naval Undersea Warfare Center (NUWC) in July 2015. In this position, he is responsible for leading more than 5,000 scientists, engineers, technicians and support personnel, both civilian and active duty, within two NUWC divisions. NUWC provides full spectrum research, development, test and evaluation, engineering, and fleet support for submarines, autonomous underwater systems, and offensive and defensive weapon systems associated with undersea warfare.

Personal awards include the Legion of Merit (two awards), Defense Meritorious Service Medal, Meritorious Service Medal (two awards), and various other personal, campaign, and unit awards.



MR. GEORGE M. DRAKELEY, III

*Executive Director, Program Executive Officer
Submarines Office of the Assistant Secretary of the Navy*

Mr. Drakeley currently serves as the executive director for the Program

Executive Office for Submarines. In this position, he serves as the senior civilian official responsible for the daily operations of PEO Submarines, including civilian management, and design, acquisition and construction for submarine platform and undersea systems. Mr. Drakeley was selected for the Senior Executive Service in January 2010 to serve as director for the Marine Engineering Group within the Naval Systems Engineering Directorate of the Naval Sea Systems Command (NAVSEA). He was NAVSEA's deputy warranting officer for Marine Engineering, responsible for implementing and overseeing technical authority for all HM&E systems on all Navy ships and submarines. He then became the director of Submarine/Submersible Engineering. In this position, Mr. Drakeley was responsible for the systems

engineering for all Navy Submarines and Submersibles. This responsibility included the design, manufacturing and fleet support for all these platforms.

In 1978, Mr. Drakeley began his career as a Nuclear Qualified Officer on the USS Arkansas CGN-41 where he served as M Division Officer and Electrical Assistant. During this tour, he also ran the nuclear testing for the full ship shock test. He then became the RADCON Officer on the USS Acadia AD-42, making two WESTPAC deployments.

In 1985 upon leaving active duty, Mr. Drakeley joined the Ohio Class Program office of NAVSEA. In the program office he was responsible for all OHIO Class Submarine electrical systems and developed magnetic bearing and active noise cancellation technologies for the Navy.

In 1997 Mr. Drakeley joined the Virginia Class Program Office where he served as the Test and Evaluation (T&E) Manager for

the Virginia Program Office and the Shock, Noise and Target Strengths Branch Head in the Team Submarine Technical Group. After this he became the Assistant Program Manager (APM) for Construction and Test. Mr. Drakeley then became the Deputy Program Manager for the Virginia Class Program. He was responsible for managing the \$90 Billion dollar program. As the Deputy, Mr. Drakeley delivered the first three VIRGINIA Class Submarines.

In 2008 Mr. Drakeley became the special assistant for acquisition in the VIRGINIA Class Program Office. In this position he successfully led the VIRGINIA Class Cost Reduction Program, saving the 30 ship program over \$4B. He then negotiated a contract for 8 VIRGINIA Class submarines valued at approximately \$14B. During this time he also served as special assistant to the commander for submarine batteries and was detailed to N87 to establish requirements for the Ohio Replacement Program.



MR. JERRY F. FERGUSON

Deputy Commander
Undersea Warfighting Development Center

Mr. Ferguson is the Deputy, Undersea Warfighting Development Center.

UWDC is the Navy's Warfighting Center of Excellence for Undersea Warfare, and is headquartered in Groton, Connecticut with detachments in San Diego, Norfolk, and Yokosuka, Japan. UWDC is responsible for training, assessment, tactical development, and analysis of Undersea Warfare capabilities including Submarines, UUV, Strike Group and Theater ASW, and integrated Fleet Operations.

He was appointed to the Senior Executive Service in December, 2004 when he was selected as the Deputy for the then-newly established Fleet Antisubmarine Warfare Command. Mr. Ferguson led the development of the integrated Antisubmarine Warfare training continuum that remains in use for all Navy Strike Groups. His Fleet Integrated Prioritized Capability List, which delineates fleet requirements to the CNO, has become standard practice force wide.

In October, 2006 Fleet Antisubmarine Warfare Command merged with the Navy Mine Warfare Command to form the Naval Mine and Antisubmarine Warfare Command where he continued to serve as the Deputy. NMAWC was the Navy's Warfighting Center of Excellence for Mine Warfare and Antisubmarine Warfare and conducted integrated Undersea Warfare training and assessment Navy-wide.

In September, 2015 the ASW team from Naval Mine and Antisubmarine Warfare Command shifted to become part of the new Undersea Warfighting Development Center.

Prior to joining the civil service, Mr. Ferguson served as an Active Duty Navy Officer. Afloat, he served as an OIC of several Direct Support Elements aboard U.S. Pacific Fleet Submarines. He commanded USS HARRY W. HILL (DD-986), and served as Operations Officer for Commander, Cruiser Destroyer Group THREE / USS CARL VINSON (CVN-70) Battle Group. As Commander, Destroyer Squadron FIFTEEN, Mr. Ferguson commanded the Yokosuka, Japan-based escorts for the USS INDEPENDENCE (CV-62) and USS KITTY HAWK (CV-63) Battle Groups.

He served in a number of shore staff assignments, including Director, ASW Requirements Division (N74) for the Chief of Naval Operations. As N74, he led the development of the Navy's initial USW Mission Capability Package which blended ASW and Mine Warfare requirements and programs. During his last year as N74, he served simultaneously as Head, Warfare Integration Branch (N702) for the then-new Warfare Integration Division (N70) and oversaw the development of Mission Capability Packages for all naval warfare areas.

He concluded his Active Duty service as Chief of Staff for Commander, Carrier Group One. COMCARGRU 1 conducted advanced warfare training for all West Coast Carrier and Expeditionary Strike Groups.

Mr. Ferguson earned a Bachelor's Degree from Eckerd College and a Master's Degree from Georgetown University.

He was awarded the Navy Meritorious Civilian Service Medal and Navy Superior Civilian Service Medal. His active duty decorations included the Legion of Merit (five awards) and Meritorious Service Medal (four awards)



CAPT STEPHEN MACK

Commodore
COMSUBDEVON FIVE

Captain Steve Mack, attended

the University of New Mexico earning a Bachelor of Science Degree in Electrical Engineering. He was selected for the Submarine Scholarship Program at Johns Hopkins University, Applied Physics Laboratory, earning a Masters of Science Degree in Electrical Engineering and a Post Masters Certificate for Advanced Study in signal processing.

His sea duty assignments include Division Officer onboard USS ALASKA (GOLD) for five strategic deterrent patrols, Navigator onboard USS MEMPHIS for two North

Atlantic deployments, and Executive Officer onboard USS VIRGINIA for her maiden deployment. Following his Department Head tour, he was selected as the first U.S. Submariner to attend the U.K. Submarine Command Course – 'Perisher'. He commanded USS HAWAII (SSN 776) with the ship completing two Western Pacific deployments and earning the Battle Efficiency 'E' for 2010 and 2012.

His shore assignments include Naval Submarine School, Groton, CT; Exchange Officer at the Submarine Headquarters at HMAS STIRLING, Western Australia; Deputy for Operations at Submarine

Squadron SEVEN; and Submarine Squadron ONE; COMSUBPAC Prospective Commanding Officer Instructor; and USPACOM Current Operations (J33).

Captain Mack's personal awards include the Defense Superior Service Medal, the Legion of Merit (three awards), the Meritorious Service Medal (two awards), the Navy and Marine Corps Commendation Medal (five awards), and the Navy and Marine Corps Achievement Medal (four awards). He is most proud of the unit awards earned by the outstanding teams with which he has been privileged to serve.



VADM WILLIAM R. MERZ

*Deputy Chief of Naval Operations
Warfare Systems (OPNAV N9)*

Vice Adm. Bill Merz is a native of San Diego, California.

He graduated from

the U.S. Naval Academy in 1986 with a Bachelor of Science in Ocean Engineering, and subsequently earned master's degrees from The Catholic University of America and the U.S. Naval War College. Merz qualified submarines on USS Haddo (SSN 604). He served as engineer officer on USS Boise (SSN 764) and as radiological controls officer on USS Proteus (AS 19). He commanded the deep sea vessel (DSV) "Submarine NR-1", USS Memphis (SSN 691) and Submarine Development

Squadron 12. His flag assignments included commander Task Force 77 and Naval Mine & Anti-Submarine Warfare Command (NMAWC) in San Diego; Commander, Task Force 54 in Bahrain; Commander, Task Force 74 in Japan; and Director, Undersea Warfare Division (OPNAV N97) in the Pentagon. Ashore he conducted submarine design research in Carderock, Maryland, completed two tours in the Pentagon as a budget programmer on both the Navy and joint staffs, served as head of the Naval Reactors' "Line Locker" and as chief-of-staff for Commander, Submarine Forces Atlantic, Commander, Task Force 144. Merz currently serves

as the Deputy Chief of Naval Operations for Warfare Systems (OPNAV N9) in the Pentagon. In this capacity, he is responsible for the integration of manpower, training, sustainment, modernization, research and development and procurement of the U.S. Navy warfare systems.

He has completed nine overseas deployments in support of U.S., Joint and Coalition submarine operations in the Pacific Command, European Command, Central Command and Africa Command. The crews he served with collectively earned six unit awards, five Battle "E"s and the Atlantic Fleet's Battenberg Cup.



RADM JOHN P. NEAGLEY

*Program Executive Officer
Littoral Combat Ships*

A native of Edison, New Jersey, Rear Adm. John Neagley graduated

from the University of New Hampshire in 1982 and received his commission from Officer Candidate School in 1984. He holds a master's degree in environmental management from Duke University, a Master of Science in Financial Management from the Naval Post Graduate School and a Master of Arts in National Security and Strategic Studies from the Naval Command and Staff College.

Neagley has served at sea aboard USS Whipple (FF 1062), USS Coral Sea (CV 43), USS John Paul Jones (DDG 53) and as executive officer on USS Antietam (CG 54), where he deployed to the Arabian Gulf and participated in Operation Desert Fox with

the Carl Vinson Battle group.

He subsequently served as chief staff officer, Destroyer Squadron 21 and deployed with the Sea Combat Commander to the Arabian Gulf with the John C. Stennis Battle Group. He assumed command of USS Fitzgerald (DDG 62) in 2001 and led her deployment to the Arabian Gulf in support of Operations Iraqi Freedom and Enduring Freedom in 2003.

Ashore, Neagley was assigned as Research and Development, Test and Evaluation (RDTEN) and Weapons Procurement (WPN) appropriations manager, Surface Warfare Directorate Office of the Chief of Naval Operations (OPNAV N86) from 1996 until 1997. He reported to Future Ships Branch (OPNAV N763) in 2003 and served as the lead requirements officer for the Littoral

Combat Ship (LCS) program. In 2005, Neagley reported to the LCS Program Office as the principal assistant program manager and director of sustainment. From 2009 to 2011, Neagley served as the program manager of (PMS 408 EOD/CREW), where he fielded explosive ordnance disposal (EOD) and counter improvised explosive device (IED) systems to Iraq and Afghanistan. He was selected as the executive assistant to Naval Sea Systems Command in June 2011 and reported as the LCS program manager in March 2012. From September 2012 until March 2016, Neagley served as Space and Naval Warfare Systems Command deputy commander, Fleet Readiness.

In May 2016 he assumed the duties as the Program Executive Officer for Littoral Combat Ships.



RADM JOHN W. TAMMEN, JR.

Director

Undersea Warfare Division Office of the Chief of Naval Operations, N97

Rear Adm. John Tammen is a native of Washington Township, New

Jersey. He graduated from Rensselaer Polytechnic Institute with a Bachelor of Science in Mechanical Engineering and earned his master's degree in engineering management from Old Dominion University.

His career as a nuclear submarine warfare officer includes assignments aboard USS Plunger (SSN 595) as a division officer, USS Nevada (SSBN 733) as the engineer officer and then USS Providence (SSN 719) as the executive officer. Subsequent command assignments include commanding officer of USS Georgia (SSBN/SSGN 729) and commodore of Submarine Squadron (SUBRON) 19.

Ashore, he has served as officer in charge of the Combat Systems Training Team on the staff of Commander, Submarine Group 5; squadron engineer on the staff of Commander SUBRON-17; Force Nuclear Power officer for the Atlantic Submarine Force; executive assistant to the director, Submarine Warfare Division, Office of the Chief of Naval Operations (OPNAV N77); deputy division chief for Joint Capabilities Division (Joint Staff J8); section head for Platforms, Payloads and Budget in Undersea Warfare (OPNAV N97); military assistant and chief of staff for the Assistant Secretary of Defense for Operational Energy Plans and Programs (OEPP), the Honorable Sharon Burke; and deputy director for Undersea Warfare (OPNAV N97).

As a flag officer, he served as the deputy director for Plans and Policy (J5) at U.S. Strategic Command and as commander of Submarine Group 9.

Tammen is currently the director, Undersea Warfare Division (OPNAV N97) in Washington, D.C., and is responsible for the planning, programming and budgeting for acquisition, operational readiness and modernization of undersea forces.

His personal decorations include Defense Superior Service Medal (two awards), Legion of Merit (four awards), Defense Meritorious Service Medal, Meritorious Service Medal (two awards), Navy Commendation Medal (five awards), Navy Achievement Medal (two awards) and various unit awards.



RDML JOHN F. WADE

Commander

Naval Surface and Mine Warfighting Development Center

Rear Adm. John Wade, a native of Port Washington, New York, earned

his bachelor's degree in economics from the U.S. Naval Academy in 1990. He holds a master's degree in information systems technology from the U.S. Naval Postgraduate School in Monterey, California, and a master's in National Security Strategy from the National War College in Washington, D.C. His assignments at sea include tours aboard USS Arthur W. Radford (DD 968), USS Benfold (DDG 65) and executive officer of USS Cape St. George (CG 71). He commanded USS Firebolt (PC 10), USS

Preble (DDG 88) and Destroyer Squadron (DESRON) 28. Over the course of his career, he completed multiple deployments supporting overseas operations to include Desert Storm, Southern Watch, Noble Eagle, Enduring Freedom and Iraqi Freedom. Ashore, Wade served on the personal staff of the chief of naval operations; executive assistant to the director of the Quadrennial Defense Review Team; deputy executive assistant to the chairman of the Joint Chiefs of Staff; and, chief of staff to Commander, Naval Surface Forces, Pacific. He also served with the Army's 10th Mountain and 82nd Airborne Divisions as commanding officer of Joint/Interagency Provincial Reconstruction Team

(PRT) – Khost, Afghanistan. Wade is the second commander of the Naval Surface and Mine Warfighting Development Center. Personal decorations include the Defense Superior Service Medal, Legion of Merit, Bronze Star, Defense Meritorious Service Medal, Meritorious Service Medal, Navy and Marine Corps Commendation Medal, Navy and Marine Corps Achievement Medal, the Army Combat Action Badge and various meritorious, service and campaign awards. He is also the recipient of the Vice Adm. E.C. Waller and Vice Adm. John D. Bulkeley leadership awards.



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