

DoD NAVY SBIR/STTR INNOVATION SUMMIT

Presented by  **ARROWHEAD CENTER® | NM FAST**
New Mexico's resource for SBIR/STTR assistance



WELCOME ADDRESS



Scott Maloney
Chief Innovator,
Arrowhead Center
at New Mexico State University

KEYNOTE ADDRESS



Robert L. Smith

Director,
Department of the Navy
SBIR/STTR Programs

Research Institutions and you: Engaging with research institutions on STTR's

Moderator: Barbara Brazil, NMEDD

Panelists

- Peter Anselmo, NMT
- Lisa Kuuttila, STC.UNM
- Terry Lombard, NMSU
- Maryann Morgan, LANL

Capturing opportunities: Lessons learned from successful SBIR/STTR submissions

Moderator: Patricia Knighten, Consultant

Panelists

- Ana Matiella, Matiella and Associates
- Hunter McDaniel, UbiQD
- Anthony Mulligan, Hydronalis
- Dan Suhr, Independent Platform

MORNING BREAK

Help! Managing your SBIR/STTR award

Moderator: Cliff Hudson, ETV

Panelists

- Stephen Avery, DCAA Compliance
- Joy Colucci, Metis Technology Solutions
- David Kellner, Cogent Innovations
- Richard McNamara, NAVSEA

WORKING LUNCH

RAPID-FIRE PITCH



Procurement Technical Assistance Center

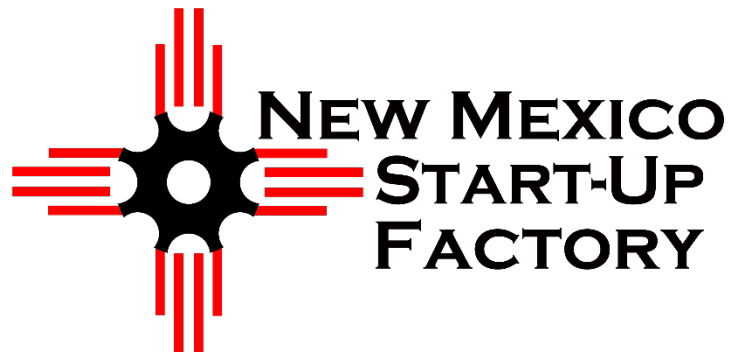
PTAC

LEARN CONNECT WIN!

Procurement Technical
Assistance Center (PTAC)

Leonard Bean
nmptac.org

RAPID-FIRE PITCH



Startup Factory

Alicia Montoya
nmsuf.com

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Autonomous and Unmanned
Systems Cluster (AUSC)

Cliff Hudson
ausc.etvamerica.com

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ABQid

Trisha Terhar
abqid.com

RAPID-FIRE PITCH



Regional Development
Corporation (RDC)

Carla Rachkowski
rdcnm.org

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WESST

Mark Gilboard
wesst.org

WORKING LUNCH

NAVSEA: Who We Are



Dean Putnam
NAVSEA SBIR/STTR Program Manager
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Who We Are



Naval Sea Systems Command



Mission:

We design, build, deliver and maintain ships and systems on time, on cost for the United States Navy.

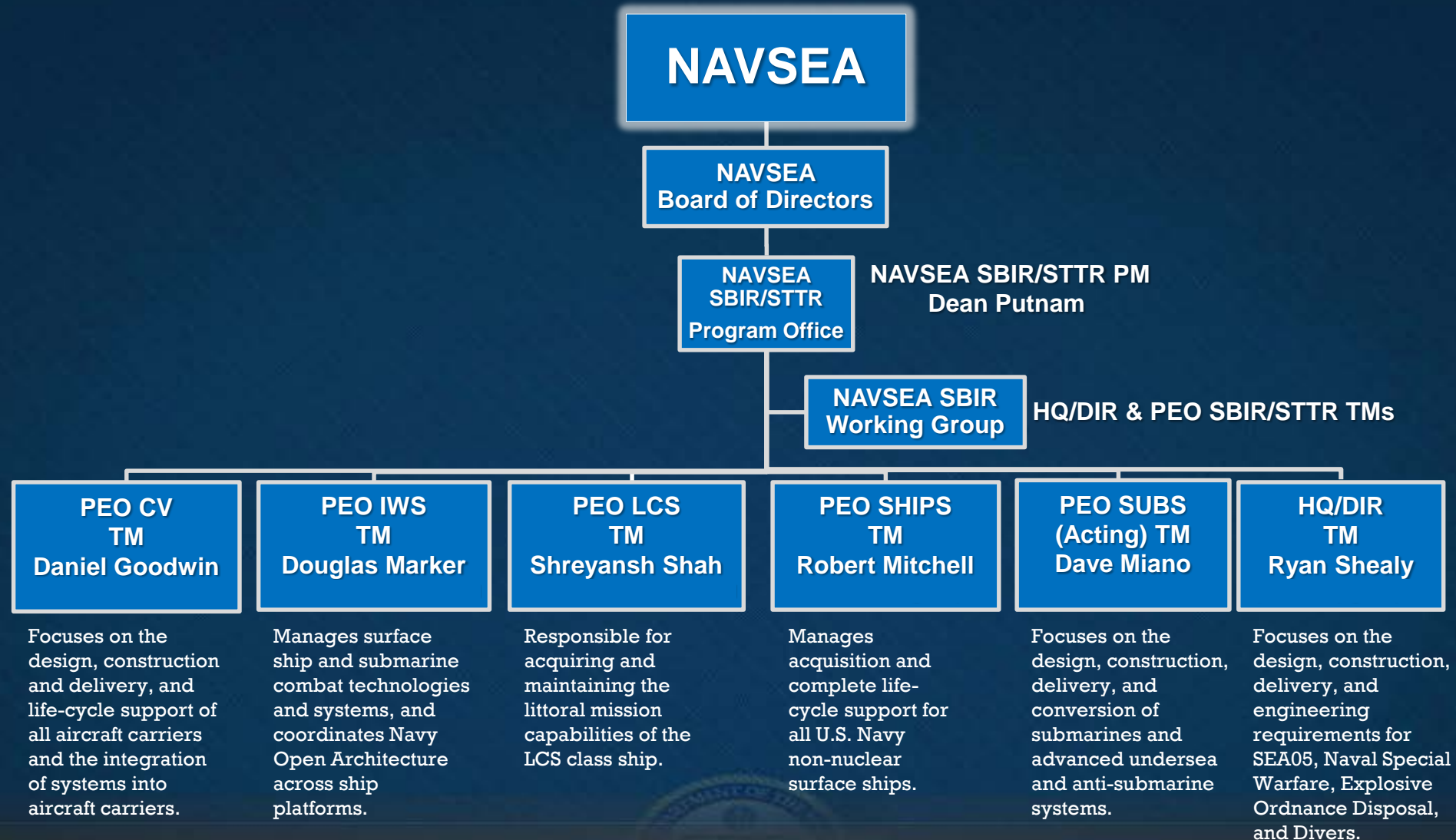
Vision:

We are the Nation's team accountable for the health of its Navy

- **We must purposefully operate to ensure the U.S. Navy can protect and defend America.**
- **We must be supported by a modern, efficient industrial base.**
- **We must be a world-class employer of choice that inspires innovation.**
- **We must set the value-added standard for acquisition, engineering, business and maintenance.**



NAVSEA SBIR Functional Organization



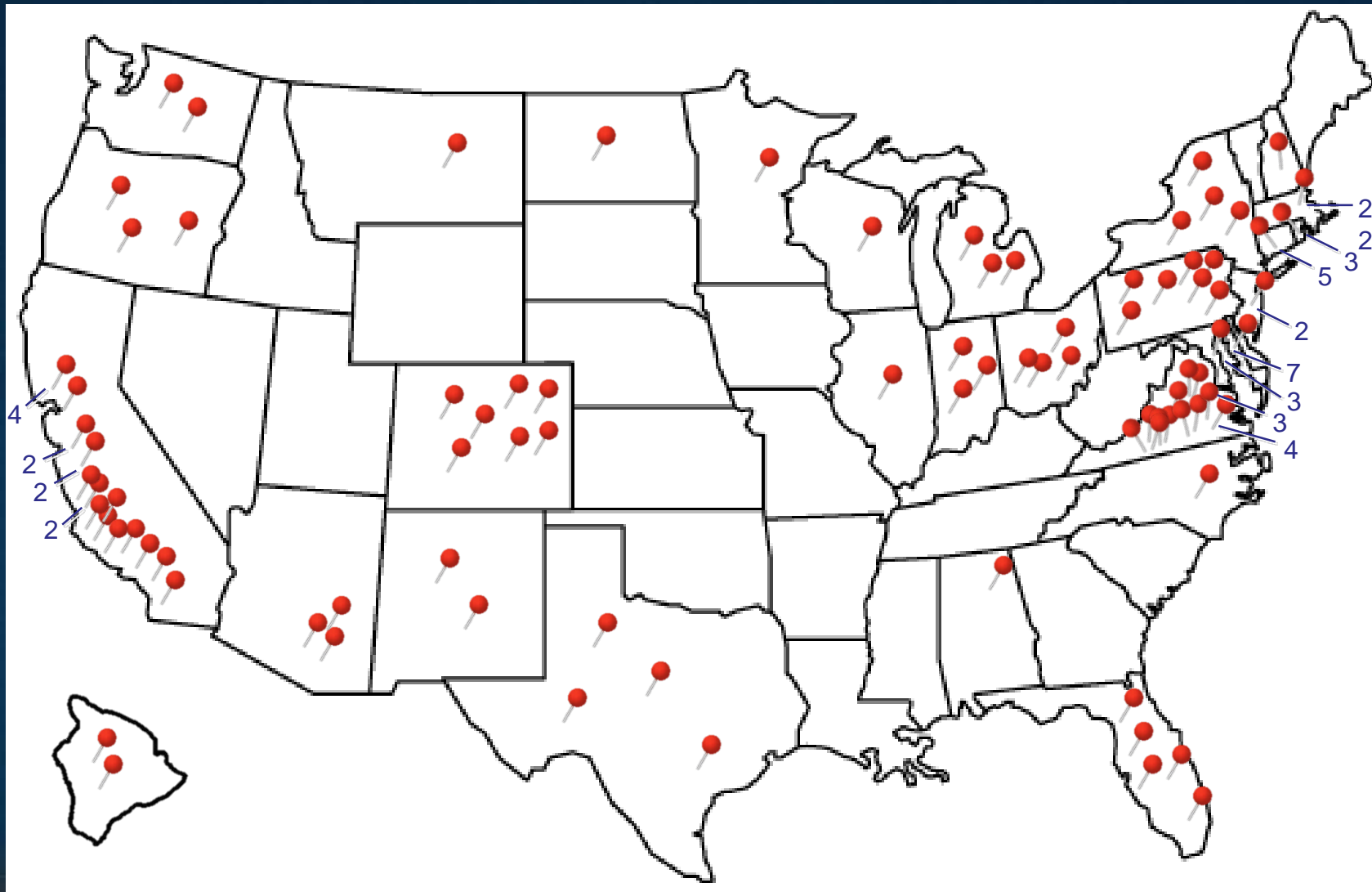
FY18.1 / A Topics

- Ship or Platform Production, Operation, Maintenance, and Disposal Costs
- Naval Affordability, Capability, and Commonality
- Improved Information Management to Maximize Warfighter Effectiveness
- Design Tools and Systems for Performance, Capability, and Commonality
- Cybersecurity Products and Processes

Beyond FY18.1 / A Topics

- Total Ownership Cost (TOC) Reduction
- Cybersecurity Products and Processes
- Design for Enhanced Learning Environments
- Tools & Management Systems to Facilitate On-time Delivery of Ships and Submarines
- Expand the Advantage through Increased Capability

Active NAVSEA SBIR Contracts



Navy SBIR/STTR Topic Workshop

Small Business Innovation Research (SBIR)
Small Business Technology Transfer (STTR) Program



NAVSEA SBIR/STTR Topics Workshop



NAVSEA SBIR/STTR NAVSEA Speakers

NAVSEA Headquarters / Directorates: Ryan Shealy, Deputy Program Manager, NAVSEA SBIR Program and Technology Manager, HQ / Dir

TEAM SHIPS: Emily Novak, Technology Coordinator, TEAM SHIPS

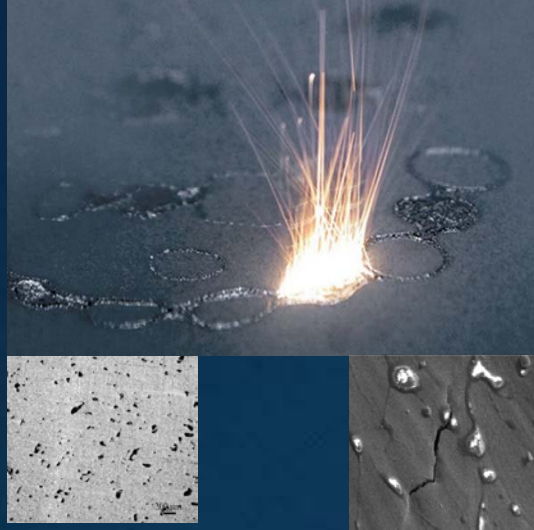
PEO SUBS: John Vlattas, Director Undersea Technology, SEA 07, TEAM SUBS

PEO LCS: Shreyansh Shah, Technology Manager, PEO LCS

PEO IWS: Douglas Marker, Technology Manager, PEO IWS

PEO CVN: Daniel Goodwin, Technology Manager, PEO CVN

NAVSEA DIR HQ



Topic Number: N18A-T013

Topic Title: Effects of Defects within Metal Additive Manufacturing Systems

Technology Objective: Develop and demonstrate an empirical repository of allowable process defects and variations to aid quality control and nondestructive evaluation of AM'd metal components.

Technological Challenge/Risk: Currently the only way to quantify the effects of defects on AM'd metal components is via "brute force" methods. Risk would be to develop a database that provides enough statistical significance to substitute data for brute force test methods.

Transition Program: SEA05T

Topic Author: Mr. Sam Pratt, NSWC CD

Topic Number: N181-043

Topic Title: Quantitative Cybersecurity Risk Assessment (QCRA)

Technology Objective: Develop an automated tool to determine the levels of cybersecurity risks quantitatively to enable allocation of cybersecurity solutions in the early design stage and reduce the time to implement cybersecurity requirements

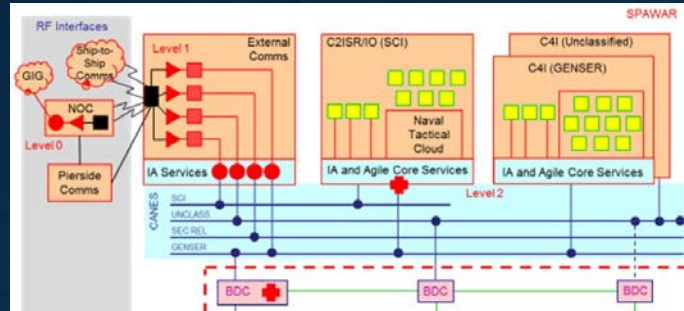
Technological Challenge/Risk: The qualitative risk analysis and assessment are subjective as they depend heavily on knowledge from subject matter experts (SMEs). However, the current approaches could potentially introduce subjective assessments that could vary by different SMEs and take time, as it is a manual process of human-in-the loop.

Transition Program: Dr. Sukarno Mertoguno, ONR 311

Topic Author: Dr. Youngok Pino, SEA05



NAVSEA SBIR/STTR NAVSEA DIR HQ



Topic Number: N181-035

Topic Title: Network Traffic Analysis for Cybersecurity for Navy Industrial Control Systems

Technology Objective: Navy must ensure cybersecurity of ICS that operates its platforms, ships, aircraft and facilities. Develop a network traffic analysis capability for industrial control systems.

Technological Challenge/Risk: Cybersecurity of Navy ICS is an urgent critical need. Solutions for business info systems (IS) seldom meet ICS needs.

Transition Program: PEO Ships

Topic Author: Richard Zebrowski, SEA05Q

Topic Number: N181-058

Topic Title: Next Generation Buoyancy Material

Technology Objective: Fabricate high resilience, high stiffness, buoyancy material with density 0.05 grams per cubic centimeter.

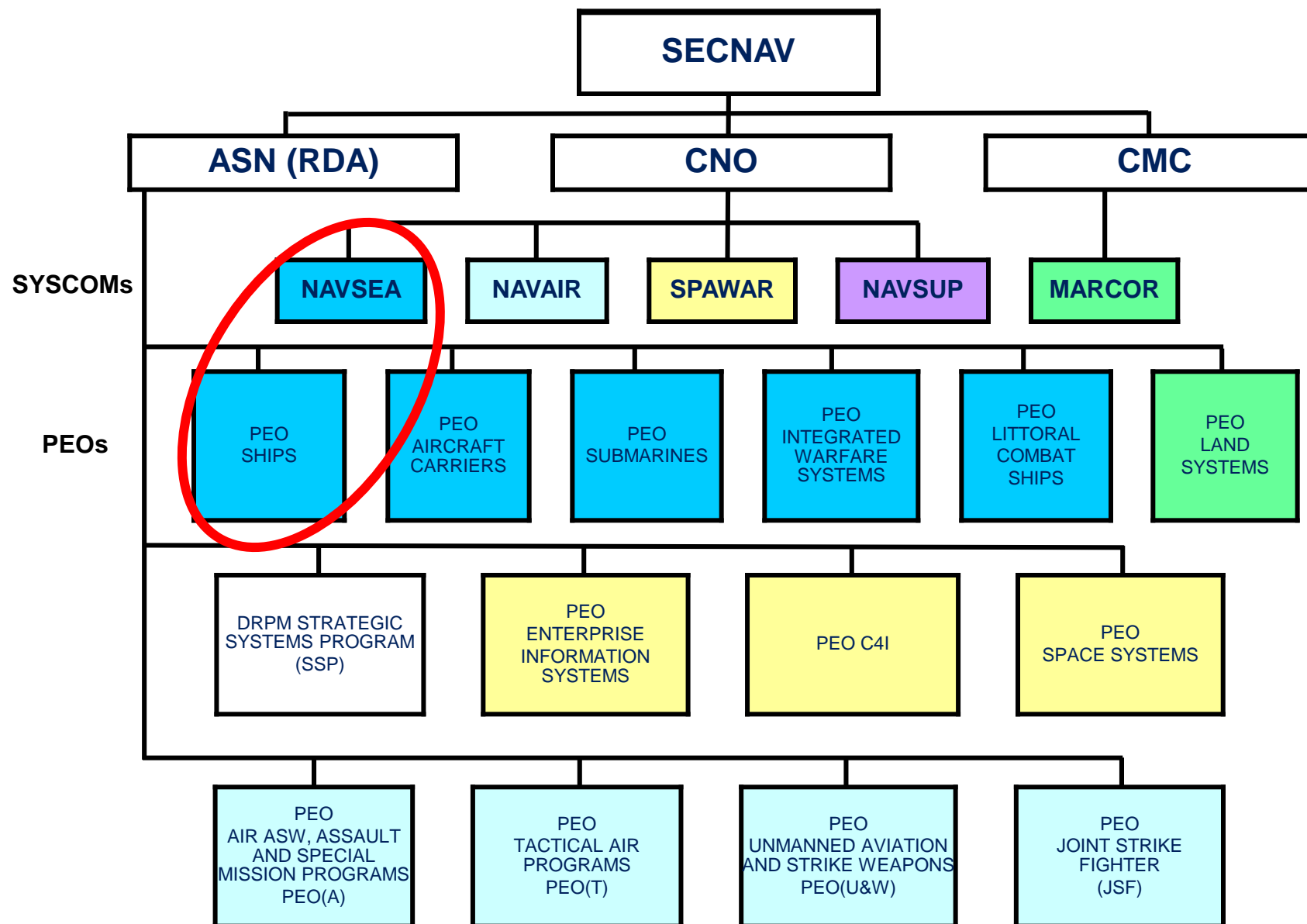
Technological Challenge/Risk: Current buoyancy foams lack sufficient strength, resilience, & stiffness at the target density. Material that achieves target density will increase technical performance, and can be additively manufactured will increase operational capacity, decrease manufacturing costs and material waste, while streamlining maintenance actions during the operations and sustainment phase.

Transition Program: PMS 340

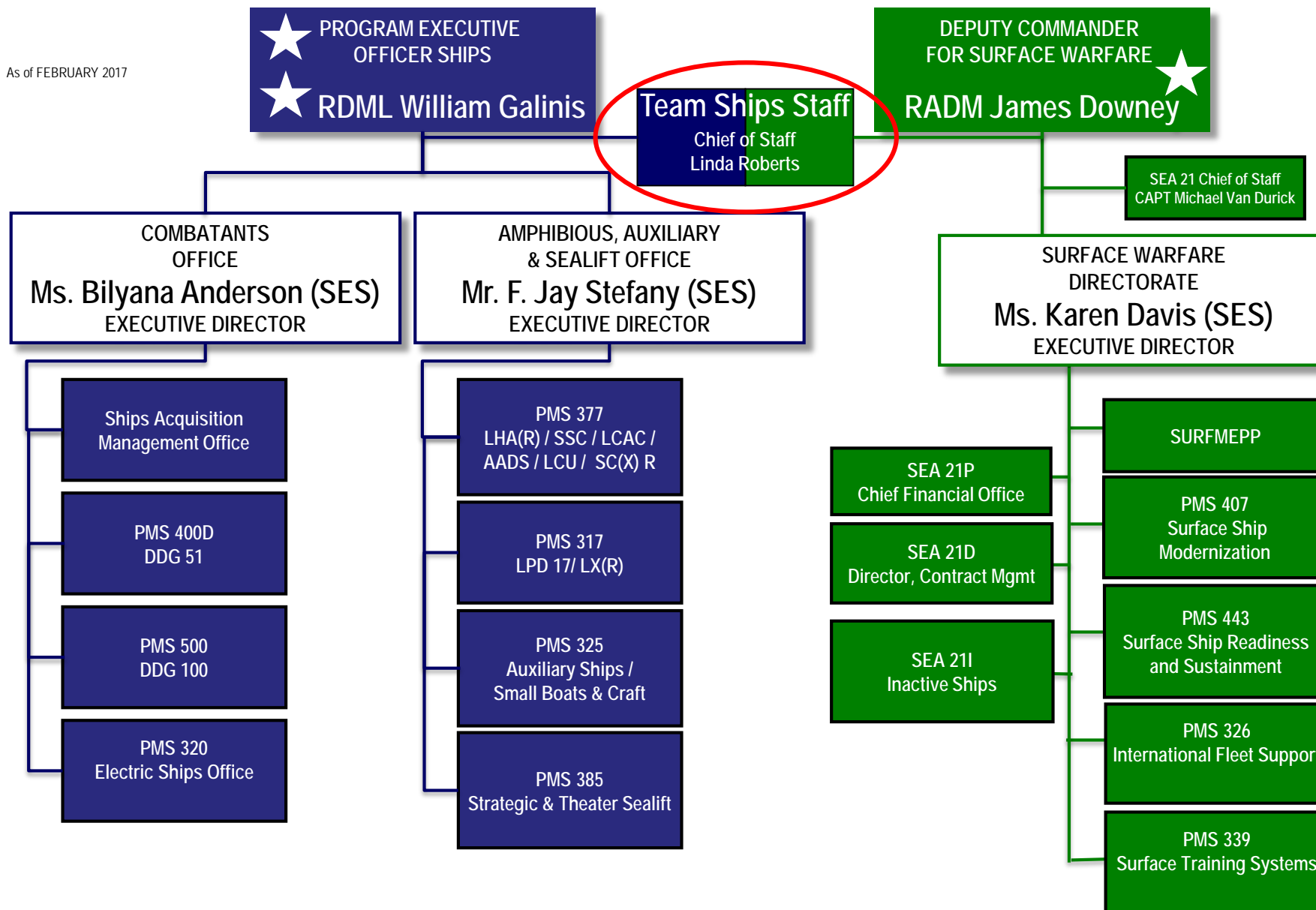
Topic Author: Dr. Aaron Wiest, NSWC Corona



TEAM SHIPS



As of FEBRUARY 2017



NAVSEA SBIR/STTR Team Ships



Topic Number: N181-041

Topic Title: Improved Capacity, High Efficiency Cryogenic Cooling System

Technology Objective: Develop innovative technology improvements to the High Temperature superconducting degaussing system (HTS DG) cryocooler and cold box to reduce cost, improve effective capacity, and increase system efficiency in cooling circulating helium gas

Technological Challenge/Risk: HTS DG system cool down time, operational efficiency and maximum serviceable cable length are directly affected by cryocooler performance and coupling of cooling to the circulating cryogen. A major risk to the HTS DG system is the inability to provide sufficient cable cooling

Transition Program: PMS 317, Amphibious Transport Dock (LPD) and Amphibious Replacement LX(R) Ship Programs

Topic Author: Dr. Jacob Kephart

Topic Number: N181-048

Topic Title: Ultra-Low Ripple 1000 Volt Direct Current Battery Charger

Technology Objective: The Navy would like high bandwidth power conversion components in highly compact and efficient power supplies with significantly reduced voltage & current ripple. Battery charging under continuous system use is a key enabler to transitioning high power electric weapons to the Fleet

Technological Challenge/Risk: Typical power conversion systems are large and have high ripple and poor power quality. Current silicon devices are large, inefficient, and do not offer sufficiently fast switching frequencies to minimize ripple when charging batteries

Transition Program: PMS 407, POM-15 Multi-Function Energy Storage Module FNC

Topic Author: Dr. John Heinzel



NAVSEA SBIR/STTR Team Ships



Topic Number: N181-056

Topic Title: Adaptable Boat Launch and Recovery System

Technology Objective: Develop technology required to handle an array of different hull forms and vessel types in boat bay launch and recovery systems.

Technological Challenge/Risk: Current launch and recovery systems for boat bays are designed for specific craft, not allowing for damage-free interface when new or modified craft are developed or desired to be integrated. Detailed interface requirements between craft and launch and recovery systems are not established to prevent craft damage. Use of emerging technologies such as new spatial awareness sensors may make it easier to accommodate a wide array of craft

Transition Program: PMS 500, DDG 1000 Class Destroyer Program

Topic Author: Mr. Steven Kubacki

Topic Number: N181-069

Topic Title: Compact, Flexible Integrated Power Node Center for Direct Current Distribution

Technology Objective: Develop a modular, galvanically isolated, IPNC to supply mission critical equipment with high quality and uninterruptible power. Ability to reconfigure the IPNCs input and output voltages will enable a common solution across multiple loads and ship types.

Technological Challenge/Risk: Designing affordable modules with sufficient efficiency to allow air cooling while maintaining power quality requirements. Achieve 20,000 hr. Mean Time Between Service Interruption. LRUs must be sized for replacement by maintenance technicians.

Transition Program: PMS 320, Electric Ships Office

Topic Author: Mr. Mark Uva



NAVSEA SBIR/STTR Team Ships



Topic Number: N181-072

Topic Title: Lightweight Gearbox for Air Cushion Vehicles

Technology Objective: Develop a lightweight gearbox for Air Cushion Vehicles (ACV) that reduces fuel consumption and improves maintainability. Investigate multi-speed capability in the lift fan section that would further increase fuel efficiency

Technological Challenge/Risk: Each ACV is equipped with two gearboxes driving its own lift fan and propeller. The replacement gearbox must fit within the existing space and interface with existing equipment on the ACV. The gearbox must meet 30 year service life (4500 operating hours), support duty cycle loads and provide variable speed output to the lift fan shaft.

Transition Program: PMS 377-6 Division, Landing Craft Technical

Topic Author: Mr. Lance Shappell

Topic Number: N18A-T009

Topic Title: Situational Awareness for Mission Critical Ship Systems

Technology Objective: Apply computational intelligence and deep learning methods towards the problem of re-gaining & maintaining state and situational awareness for distributed ship systems.

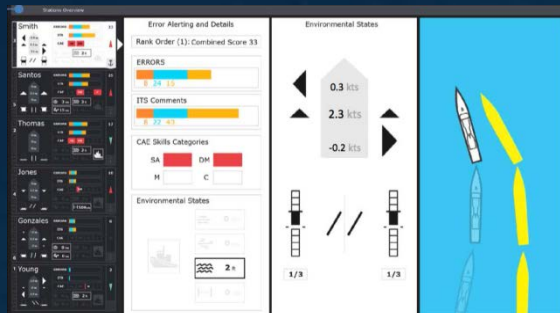
Technological Challenge/Risk: Distributed state awareness is required for the effective implementation of advanced control methods. In addition, data fusion and deep learning methods show promise towards providing human operators the context and timely information required to maintain situational awareness of the machinery plant during complex and time critical operations. This project will make advances toward implementing these methods in a navy standard Machinery Control System.

Transition Program: Robust Combat Power Control FNC

Topic Author: Dr. Frank Ferrese



NAVSEA SBIR/STTR Team Ships



Topic Number: N18A-T014

Topic Title: Advanced Ship-handling Simulators

Technology Objective: Develop an enhancement to current Intelligent Tutor Systems (ITS) for ship handling simulators with adaptive coaching and post evaluation capability.

Technological Challenge/Risk: Current ITS ship handling systems are fairly simplistic offering warnings when a student deviates from a designated envelope of prudence (course, speed, ship alignment/angle), Enhancements are needed in adaptive coaching to provide a real-time judgment with coaching/encouragement and enable post-evolution debriefing. One option could be a visible avatar within the virtual reality of the current simulator.

Transition Program: PMS 339 Surface Training Systems

Topic Author: Ms. Tylvia Addoh

Topic Number: N18A-T015

Topic Title: Combatant Craft Health Monitoring System

Technology Objective: Provide a capability for Combatant Craft systems performance monitoring, review, diagnostics, and prognostics with a small, unobtrusive system to reduce total ownership cost.

Technological Challenge/Risk: There is no current integrated system providing Condition-Based Maintenance (CBM), self diagnostics, system and personnel health data. Mission feedback for post mission evaluation and data archival is also challenging and subject to individual interpretation. Navy Expeditionary Combat Command has an S&T Objective for diagnostics, prognostics and predictive maintenance system with fuel tracking.

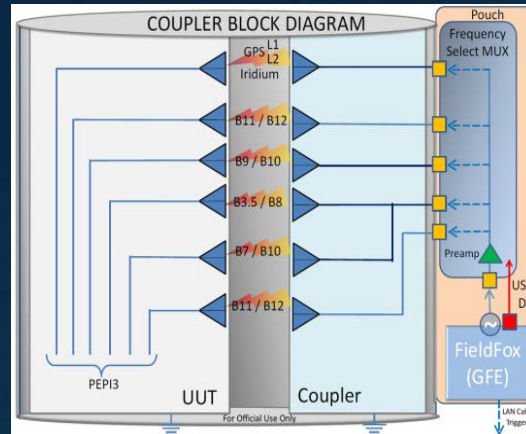
Transition Program: PMS 325G, Support Ships, Boats and Craft

Topic Author: Mr. Scott Petersen



PEO SUBS

NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-063

Topic Title: Mast Antenna Coupler

Technology Objective: The development of a modular enclosed antenna coupler improves radiated end-to-end testing and calibration routines for electronics support measures (ESM) systems. The shroud's shielding mechanisms will provide the capability of testing sensitive RF antennas and associated RF paths in dense electromagnetics (EM) environments.

Technological Challenge/Risk: Performance of test conducted, shielding of on-site environmental interference, communicating signals to all desired frequencies.

Transition Program: PMS 435, Electronic Warfare and Imaging

Topic Author: Keven Goncalves, NUWC Newport

Topic Number: N181-070

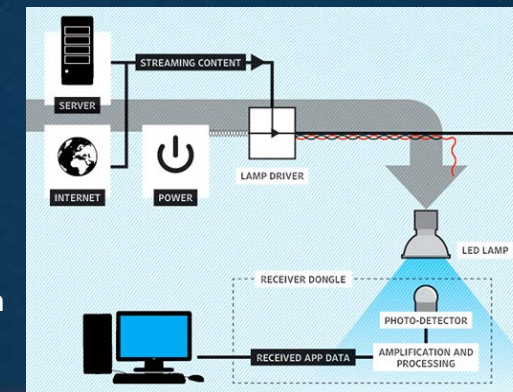
Topic Title: Data Transmission using Visible Light Communication (VLC) for Undersea Platforms

Technology Objective: Develop a secure, high speed visible light communication (VLC) system that will potentially replace much of the GbE cabling currently being utilized for high speed networks. This topic will provide an increase in the reliability and performance of electronic warfare systems.

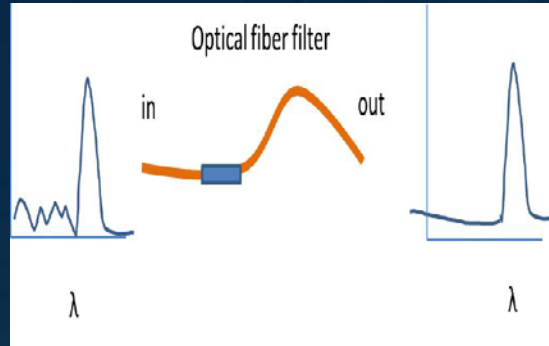
Technological Challenge/Risk: Development of the system to reach a desire data rate and mitigation of interfereors.

Transition Program: PMS 435, Electronic Warfare and Imaging

Topic Author: Keven Goncalves, NUWC Newport



NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-050

Topic Title: Tunable Optical Filters for Radio Frequency (RF) Photonic Signal Distribution Systems

Technology Objective: Develop a tunable, wavelength and bandwidth scalable, optical band-pass filters for use in optical signal distributions systems.

Technological Challenge/Risk: Development of a means for high rejection of signals spectrally located GHz from the passband requires technical innovation.

Transition Program: PMS 435, Electronic Warfare and Imaging

Topic Author: Dr. Ronald LaComb, NUWC Newport

Topic Number: N181-042

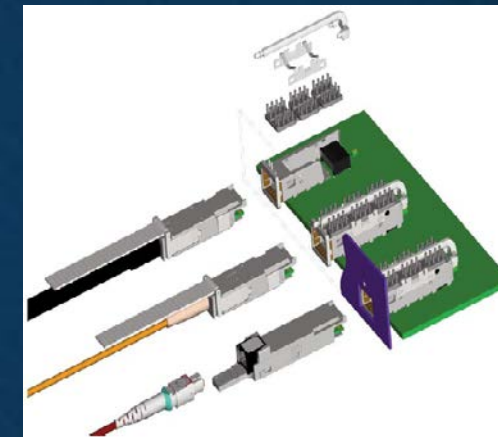
Topic Title: Ruggedized High Speed Optical Fiber Network Connector for Next Generation Submarine Electronic Warfare (EW) Systems

Technology Objective: Develop a ruggedized interface for use with commercially available high speed switches and network interface cards that is low cost, maintains high data rates, operates in harsh environments, and has high mean time between failure.

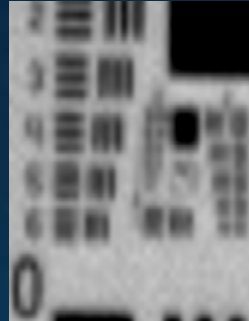
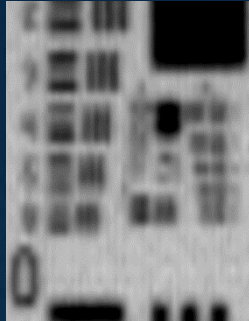
Technological Challenge/Risk: Develop high reliability, low cost ruggedized, Improved performance in harsh environment and maintains high data rates

Transition Program: PMS 435, Electronic Warfare and Imaging

Topic Author: Helder Avelino, NUWC Newport



NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-044

Topic Title: Near Ocean Imaging through Atmospheric Turbulence

Technology Objective: Develop an algorithm to remove atmospheric caused blur and contrast reduction caused by atmospheric scattering.

Technological Challenge/Risk: Reduce the impact of near ocean atmospheric turbulence on imaging resolution and contrast.

Transition Program: PMS 435, Electronic Warfare and Imaging

Topic Author: Jose Barbosa, NUWC Newport

Topic Number: N181-067

Topic Title: Real-Time Compression for Acoustic Array Time-Domain Data

Technology Objective: Lossless acoustic data compression optimized for acoustic array data to enable SATCOM data exfiltration

Technological Challenge/Risk: Enable data from acoustic arrays to be transmitted in real-time without degradation to shore facilities for processing by specialists. Very high data compression rate (90-95%) required to enable real-time SATCOM transmission of acoustic data.

Transition Program: PMS485, Maritime Surveillance Systems

Topic Author: Mandeep Nehra, PMS485



NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-074

Topic Title: Field Programmability System (FPS) Modernization for Mark 39 Expendable Mobile Anti-Submarine Warfare (ASW) Training Target (EMATT)

Technology Objective: Modernize, innovate and reduce cost of the Field Programmability System (FPS) for the MK39 Expendable Mobile ASW Training Target.

Technological Challenge/Risk: Project seeks to reduce operational and procurement risk due to obsolescence and high refurbishing cost while using a simplistic and user friendly method. In addition, reduce the risk of failures due to legacy technology.

Transition Program: PMS404 Undersea Weapons Program Office

Topic Author: Tomas Pagan-Soto, NUWC Newport

Topic Number: N181-032

Topic Title: Electroactive Polymer Actuators for Unmanned Undersea and Surface Vehicles

Technology Objective: Improve survival of unmanned undersea and surface vehicles in very high sea states by replacing electromagnetic mechanical controls with robust polymer-based actuators.

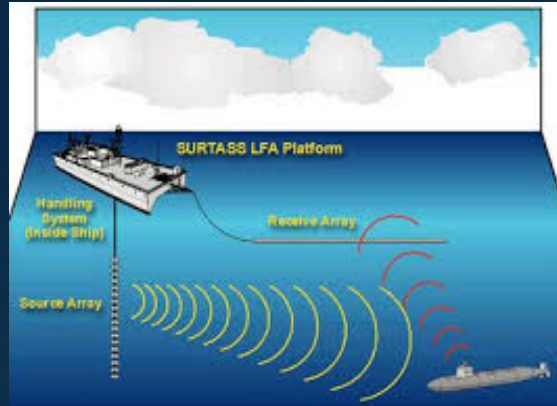
Technological Challenge/Risk: Improved availability and survivability of UxV systems to meet the requirements of operationally relevant ocean environments.

Transition Program: PMS485, Maritime Surveillance Systems

Topic Author: Mandeep Nehra, PMS485



NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-036

Topic Title: Hydrodynamic Control of a Towed Vertical Array

Technology Objective: Use autonomous hydrodynamic controls to enable the vertical array to maintain straightness when towed

Technological Challenge/Risk: Vertical array elements are difficult to control because they are very large and heavy

Transition Program: PMS485, Maritime Surveillance Systems

Topic Author: Mandeep Nehra, PMS485

Topic Number: N181-049

Topic Title: Advanced Analyzers for Monitoring Submarine Atmosphere

Technology Objective: Identify cost-effective new atmosphere monitoring technologies to be used in a flexible, tunable system

Technological Challenge/Risk: Current monitoring system is costly to maintain, and not sufficiently flexible for future applications.

Transition Program: PMS397, COLUMBIA Class Submarines

Topic Author: Jay Smith, NSWC Philadelphia



NAVSEA SBIR/STTR PEO SUBS



Topic Number: N181-040

Topic Title: Submarine Rescue Shallow Water Rescue Capability

Technology Objective: Develop a solution to enhance the current submarine rescue capability to support shallow-water pressurized rescue

Technological Challenge/Risk: USN has no capability to rescue survivors from a DISSUB with an internal pressure of 5 ata in waters less than approximately 400 fsw.

Transition Program: PMS391, Escape & Rescue Program Office

Topic Author: Stephanie Mohundro, PMS391

Topic Number: N181-047

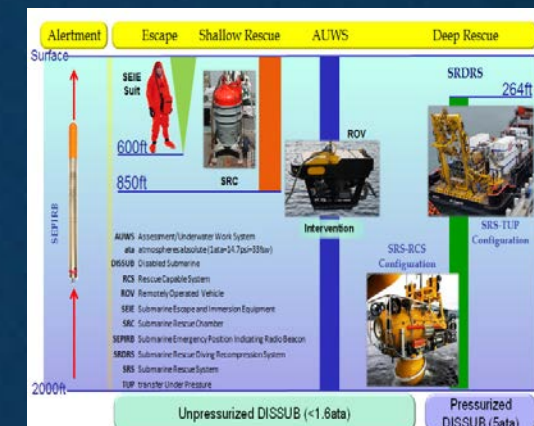
Topic Title: Decompression of Atmosphere Onboard Distressed Submarine

Technology Objective: Develop a means to reduce the internal atmospheric pressure of a DISSUB without the need for ship's electrical power.

Technological Challenge/Risk: USN has no capability to lower the internal pressure of a DISSUB. Lack of electrical power and limited access prevents the use of existing ship equipment.

Transition Program: PMS391, Escape & Rescue Program Office

Topic Author: LCDR Josh Peters, PMS391



PEO LCS



Program Executive Office Littoral Combat Ship



NAVSEA SBIR/STTR PEO LCS



Topic Number: **N18A-T016**

Topic Title: **Analysis and Application of Treatments to Mitigate Exfoliation Corrosion (Delamination) of 5XXX Series Aluminum**

Technology Objective: Conduct a comprehensive analysis of surface treatments that may provide protection against (prevention) exfoliation corrosion, perform small scale testing and develop a test plan and test plausible surface treatments for prevention and mitigation of exfoliation corrosion.

Technological Challenge/Risk: Both LCS variants use 5XXX marine grade aluminum alloys that are susceptible to exfoliation corrosion.

Transition Program: **PMS 505 LCS Fleet Introduction & Sustainment /515 Frigate**

Topic Author: **Michael Pyryt, PMS 501, NSWC Philadelphia**

Topic Number: **N18A-T010**

Topic Title: **In Situ Marine-Grade Aluminum Alloy Characterization for Sensitization Resistance and Stress Corrosion Cracking Prediction**

Technology Objective: Quantifying the relationship between dislocation density or “atomistic imperfections” in Al alloy materials, such as 5083 H116, as a result of the manufacturing process could lead to the ability to more easily quantify the likelihood of Al sensitization and lead to a better understanding of when SCC is expected to initiate during the life of the ship. Algorithms developed as a result of this STTR would be incorporated to create more robust, fieldable SSC prediction tools that are being developed under an FY14 ONR FNC.

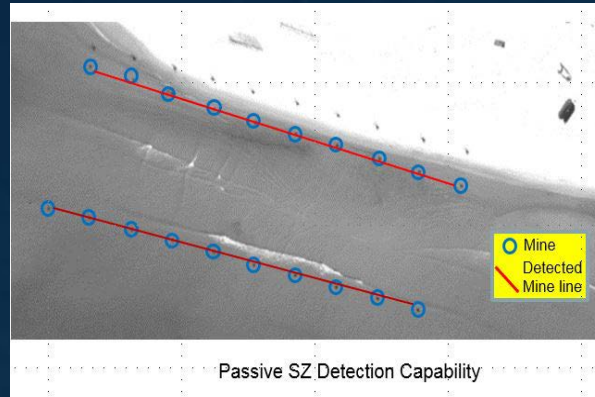
Technological Challenge/Risk: Due to cracking issues experienced on the CG47 Class, the ability to predict sensitization and stress corrosion cracking onboard both LCS and the future Frigate has become of interest to PMS 501, 505, 515, SEA 05P and N96.

Transition Program: **PMS 505 LCS Fleet Introduction & Sustainment /515 Frigate**

Topic Author: **Dr. William Golumbskie, NSWC Carderock**



NAVSEA SBIR/STTR PEO LCS



Topic Number: N181-073

Topic Title: Passive Surf Zone Minefield Detection (PSZMD) on the Coastal Battlefield Reconnaissance and Analysis (COBRA) System

Technology Objective: Develop and demonstrate a Real-Time, Daytime, Surf Zone Mine Detection (SZMD) capability using a COBRA's Block I multispectral sensor (MSI SFW or SMSI)

Technological Challenge/Risk: Limited SZ Detection capability is an operationally relevant threat to the COBRA Block I mission

Transition Program: PMS495 Mine Warfare

Topic Author: Dawn Klamser

Topic Number: N181-039

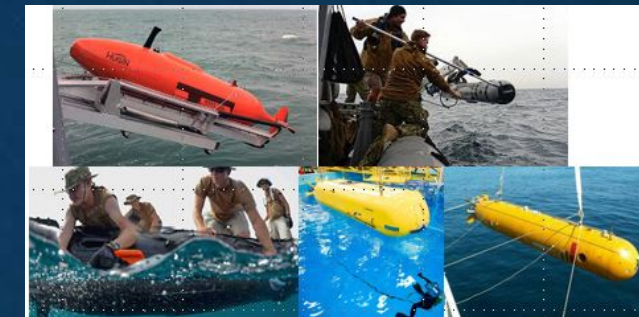
Topic Title: Common Unmanned Underwater Vehicle (UUV) Launch and Recovery System

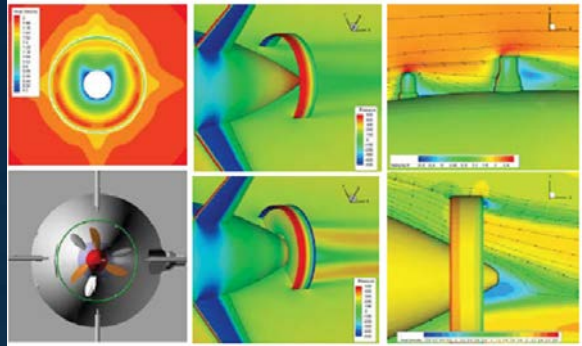
Technology Objective: A modular capability to stern launch and recovery a variety of UUVs of different size from dissimilar ship platforms will increase the use of UUVs aboard ship. Modularity provides flexibility and reduces cost and reduces technology insertion risk.

Technological Challenge/Risk: Improve the safety and performance of shipboard mission package handling equipment (both hardware and software) including movement, launch, and recovery of off-board vehicles.

Transition Program: PMS420 LCS Mission Modules

Topic Author: Darryl Updegrove, NSWC Panama City





Topic Number: N18A-T012

Topic Title: New Integrated Total Design of Unmanned Underwater Vehicles (UUVs) Propulsion System Architecture for Higher Efficiency and Low Noise

Technology Objective: Develop and parametrically validate the design of a new integrated propulsion system specifically designed and optimized to increase the overall propulsion efficiency and reduce the noise signature of underwater vehicles. The new propulsion system will ensure scalable performance when applied to different UUVs sizes, from micro-UUVs to LDUUVs

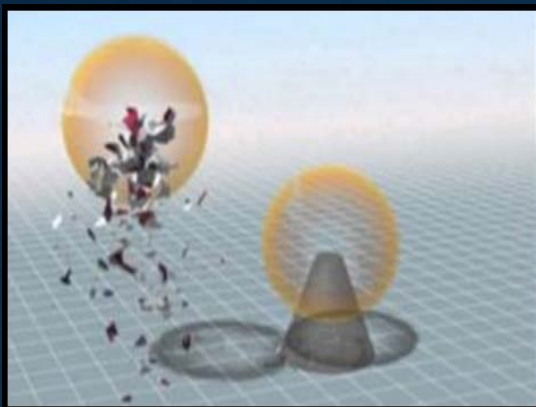
Technological Challenge/Risk: As more stress is placed on autonomy requiring more power intense sensors and computing, not having to compromise range and duration will necessitate the most efficient use of power for propulsion.

Transition Program: PMS 406 Unmanned Maritime Systems

Topic Author: Michael Zarnetske, NUWC NPT

PEO IWS 1

NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-059

Topic Title: Surface to Air Missile Interceptor Debris Model for Anti-Ship Cruise Missile (ASCM) Defense

Technology Objective: Develop debris modeling software for ASCM defense that models debris patterns of interceptor detonation and target destruction to enhance AEGIS combat system (ACS) effectiveness.

Technological Challenge/Risk: Due to the evolving threats combat system software now needs to counter the effects of intercept debris in an increasingly complex Anti-Air Warfare (AAW) threats environment.

Transition Program: PEO IWS 2, Aegis Program Office

Topic Author: Bob Rumbaugh, IWS 1.0, Washington Navy Yard

Topic Number: N181-033

Topic Title: Virtual Assistant for Combat System Console Operators Utilizing Artificial Intelligence Algorithms

Technology Objective: Provide a virtual assistant tool for combat system console operators that improves efficiency and provides recommended actions using artificial intelligence algorithms.

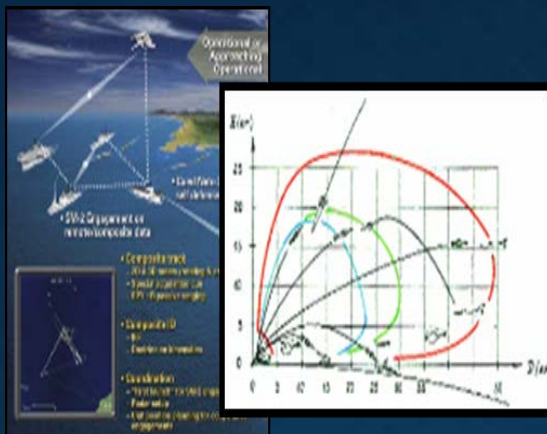
Technological Challenge/Risk: Providing a new tool that dynamically adapts to the complex and data rich tactical situations to increase the task-handling capacity of operators.

Transition Program: PEO IWS 1, Future Surface Combatant (FSC)

Topic Author: Scott Bewley, PEO IWS 1, Washington Navy Yard



NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-046

Topic Title: Tracking Algorithm(s) for Determining Highest Probability Predicted Intercept Points(s) in the AEGIS Combat System

Technology Objective: Develop tracking software algorithm(s) that instantly and accurately predict the highest probability of kill intercept points for multiple simultaneous and/or staggered threats.

Technological Challenge/Risk: Creating a new tracking software capable of instantly assessing the highest probability of kill for targets in raid scenarios to effectively neutralize or destroy multiple simultaneous and/or staggered threats.

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: Bob Rumbaugh, IWS 1, Washington Navy Yard

Topic Number: N181-055

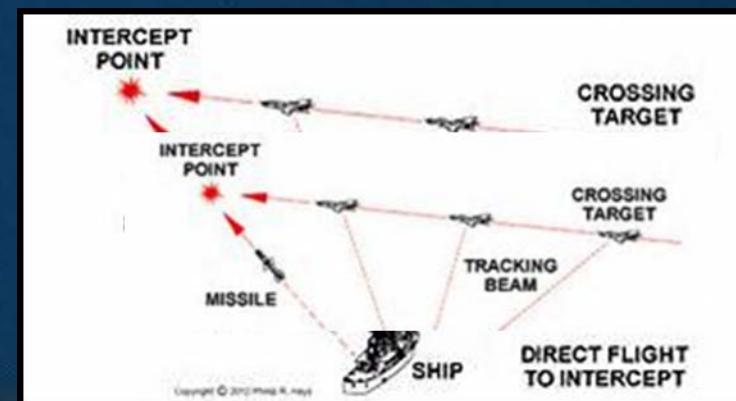
Topic Title: Scheduling Algorithm for Efficient and Effective Predicted Intercept Points (PIPs) for Multiple Targets

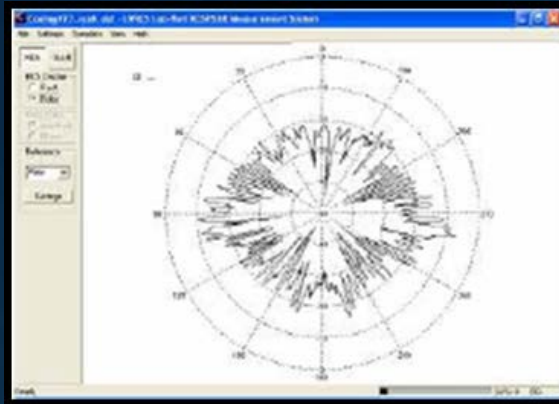
Technology Objective: Develop a scheduling software algorithm that instantly and accurately predicts intercept points between an interceptor and a target for multiple simultaneous and/or staggered threats.

Technological Challenge/Risk: Creating new scheduling software capable of instantly planning in raid scenarios to proficiently neutralize or destroy multiple simultaneous and/or staggered threats

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: Bob Rumbaugh, IWS 1, Washington Navy Yard





Topic Number: N181-052

Topic Title: Sea Wave Clutter Modeling for Enhanced AEGIS Combat System (ACS) Simulation

Technology Objective: Develop a software application that simulates the effects of wave clutter for the AEGIS Combat System (ACS) to enhance its design and validation of sensor detection and tracking in Anti-Surface Warfare (ASuW) and Anti-Air Warfare (AAW).

Technological Challenge/Risk: Creating a new capability that accurately models wave characteristics and their interactions with surface and air objects to create a dynamic mapping capability for ship operations.

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: Bob Rumbaugh, IWS 1, Washington Navy Yard

Topic Number: N181-031

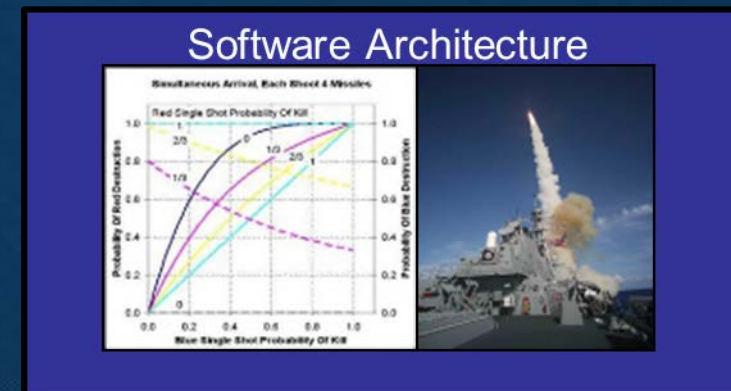
Topic Title: AEGIS Combat System Optimization through Advanced Modeling of Software-Only Changes

Technology Objective: Develop modeling and analysis software to optimize software-only changes in the Anti-Air Warfare (AAW) system design to address new re-designs of Anti-Ship Cruise Missiles (ACSMs) threats.

Technological Challenge/Risk: Finding a method that will investigate and analyze live fire or modeling failures and provide redesign prospects for the Combat System

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: John Clarke, IWS 1, Washington Navy Yard



NAVSEA SBIR/STTR

PEO IWS



Topic Number: N181-068

Topic Title: Pattern Recognition Algorithms for Detection of Latent Errors in Combat System Software

Technology Objective: Develop pattern recognition algorithms that identify and characterize latent errors in the software code of the AEGIS operational software prior to deployment.

Technological Challenge/Risk: Developing methods to ensure the builds of better quality, faster and cheaper software of Combat System software is maximized.

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: John Clarke, IWS 1, Washington Navy Yard

Topic Number: N181-051

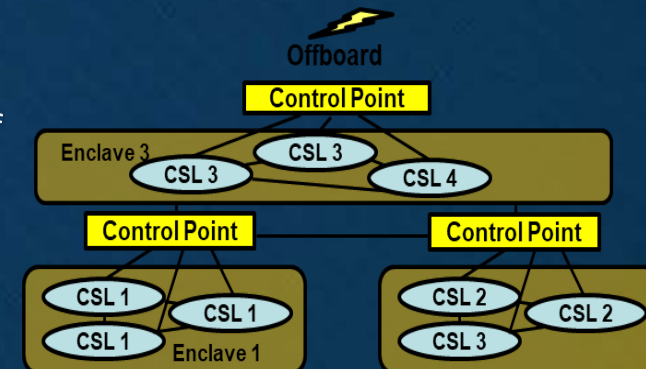
Topic Title: Unified Cybersecurity System Modeling of Naval Control Systems

Technology Objective: Develop a tool that creates a unified model for complex system of systems to enable cybersecurity analysis of Naval Control Systems.

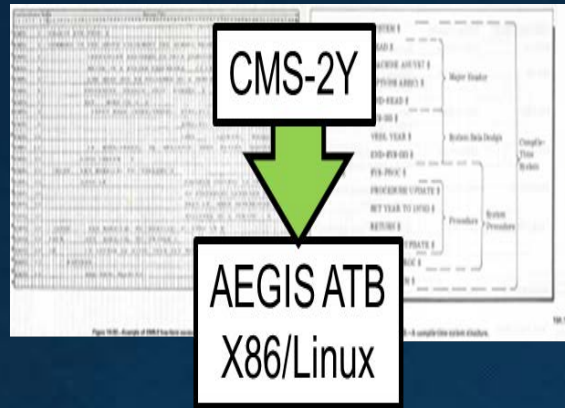
Technological Challenge/Risk: Create a modeling technology capable of providing a unified approach to model cybersecurity related system attributes and the interaction between them

Transition Program: PEO IWS 1, AEGIS and PEO IWS 10, SSDS Program Offices

Topic Author: Judah Nyden, IWS 1, Washington Navy Yard



NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-030

Topic Title: **Compiler Monitor System (CMS-2Y) Software Language Operation in X86 Linux Computing Environments**

Technology Objective: **Develop a method for executing legacy CMS-2Y tactical code on an X86 computer running the Linux operating system to validate critical software updates in the AEGIS Test Bed (ATB)**

Technological Challenge/Risk: **Creating a capability to run CMS-2Y tactical code in the ATB host on an X86 computer system with the Linux operating system to ensure it is accurately and thoroughly tested.**

Transition Program: PEO IWS 1, AEGIS Program Office

Topic Author: Bob Rumbaugh, IWS 1, Washington Navy Yard

PEO IWS 2



Topic Number: N181-065

Topic Title: Compact, Lightweight, and Affordable Mid-Wave Infrared (MWIR) Camera for Shipboard Deployment

Technology Objective: Develop a video camera for the CESARS FNC and ensuing SEWIP Block 4 program that operates in the mid-wave infrared (MWIR) band and is highly compact, lightweight, efficient, and affordable.

Technological Challenge/Risk: This topic seeks unprecedented compactness and affordability in a MWIR camera.

Transition Program: PEO IWS 2, SEWIP Program Office

Topic Author: Lawrence Dressman, IWS 2, Crane

Topic Number: N181-062

Topic Title: Efficient Compact Diode-Pumped High-Power Fiber Coupled Laser Modules

Technology Objective: Develop a highly efficient, high power density, kilowatt-level, diode pumped fiber coupled laser module.

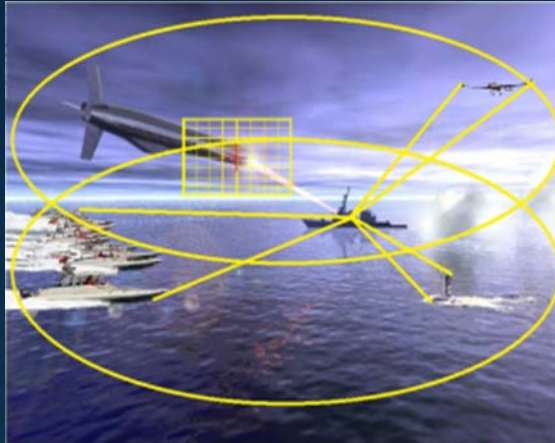
Technological Challenge/Risk: Increasing laser efficiency above 60% with output power in the range 1-5 kW within the desired compact package is extremely challenging.

Transition Program: PEO IWS 2, SEASABER Program Office

Topic Author: Lawrence Dressman, IWS 2, Crane



NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-054

Topic Title: High Performance Compact Medium-Power Long-Wave Infrared (LWIR) Laser System for Shipboard Deployment

Technology Objective: Develop a long-wave infrared (LWIR) laser system for the CESARS FNC program that is compact and has medium-power.

Technological Challenge/Risk: The required performance in the desired system volume is unprecedented in the LWIR band.

Transition Program: PEO IWS 2, CESARS FNC

Topic Author: Lawrence Dressman, IWS 2, Crane

PEO IWS 3

NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-060

Topic Title: Ablative Material for Missile Launchers

Technology Objective: Develop new ablative materials that extend the life of the Mk 41 Vertical Launch System (VLS).

Technological Challenge/Risk: Development of a replacement ablative material providing a longer life span and maintaining key characteristics of weight, thermal conductivity, and machinability.

Transition Program: PEO IWS 3, Vertical Launch Systems Program Office

Topic Author: Steve Grossen, IWS 3, Dahlgren

Topic Number: N18A-T011

Topic Title: Non-Destructive Evaluation (NDE) of Missile Launcher Ablatives

Technology Objective: Develop a non-destructive evaluation method for measuring the remaining life of ablative material in situ for the Navy Mk 41 VLS.

Technological Challenge/Risk: Provide a method to measure thickness, density, or other relevant material property after a launch in situ.

Transition Program: PEO IWS 3, Vertical Launch Systems Program Office

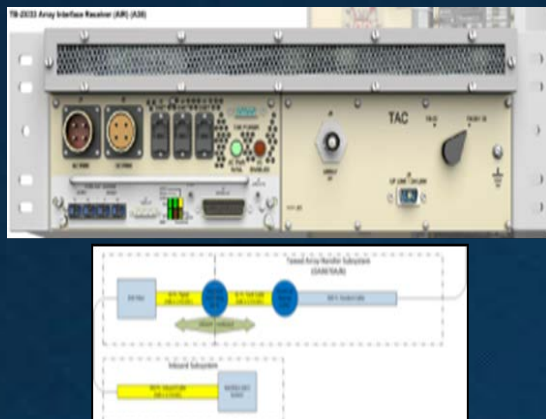
Topic Author: Steve Grossen, IWS 3, Dahlgren



PEO IWS 5

NAVSEA SBIR/STTR

PEO IWS



Topic Number: N181-045

Topic Title: High Bandwidth Towed Array Modem

Technology Objective: Develop a high bandwidth modem for Next Generation Towed Arrays that meets bandwidth, form factor, power consumption and environmental operating requirements.

Technological Challenge/Risk: Creating a new high bandwidth cable MODEM compatible with future towed array packaging, data rate, and environmental requirements

Transition Program: PEO IWS 5, Future Generation Towed Arrays Program Office

Topic Author: Robert Cutler, IWS 5, Newport

Topic Number: N181-057

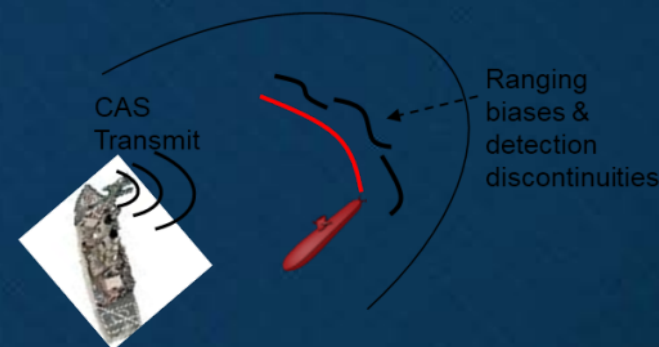
Topic Title: Physics-Based Improvements for Continuous Active Sonar (CAS)

Technology Objective: Develop physics-based signal and automated information processing algorithms for Continuous Active Sonar (CAS) to improve Detection, Classification, and Localization (DCL).

Technological Challenge/Risk: Improving CAS performance by recovering losses associated with environmental effects and target motion uncertainty cause by Doppler shift.

Transition Program: PEO IWS 5, AN/SQQ-89 Program Office

Topic Author: Meg Stout, IWS 5, Washington Navy Yard



NAVSEA SBIR/STTR

PEO IWS



Topic Number: N181-066

Topic Title: **Cognitive Maritime Imaging**

Technology Objective: **Develop a cognitive algorithm that automatically analyzes 360-degree periscope imaging and recommends optimal camera settings to the operator.**

Technological Challenge/Risk: **Providing a cognitive ability to inform periscope operators of image improvement recommendations for the visible and infrared bands.**

Transition Program: PEO IWS 5, TOTIM Optronics Masts Program Office

Topic Author: Jose Barbosa, Code 3423, Newport

Topic Number: N181-034

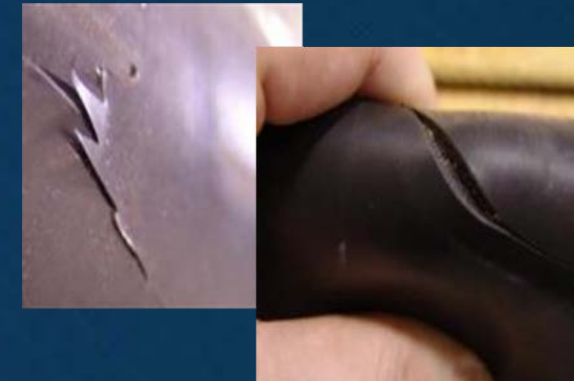
Topic Title: Surface Ship Fat-line Towed Array Cut-Resistant Vibration Isolation Module (VIM) Hose

Technology Objective: Develop a cut resistant hose for surface ship fat line vibration isolation module (VIM) that retains existing VIM hose properties.

Technological Challenge/Risk: Developing a VIM hose that is cut resistant and still meets all the performance requirements of the current VIM hose.

Transition Program: PEO IWS 5, TB-37 Towed Array Program Office

Topic Author: Robert Cutler, Code B1320, Newport



NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-061

Topic Title: Integration of Autonomous Unmanned Systems in Theater Undersea Warfare Mission Planning

Technology Objective: Develop a Mission Planning toolset that integrates autonomous unmanned systems (AUSs) with conventional manned platforms for the Theater Undersea Warfare mission planning set.

Technological Challenge/Risk: Integrating a new toolset that will include AUSs for TUSW Commanders when doing mission planning

Transition Program: PEO IWS 5, USW/DSS Program Office

Topic Author: Chidambar Ganesh, Code 2514, Newport

PEO IWS 6

NAVSEA SBIR/STTR

PEO IWS



Topic Number: N181-064

Topic Title: Scalable Directional Antenna for Unmanned Aerial Vehicles (UAVs)

Technology Objective: **Develop a scalable, directional C-Band active array antenna system with reduced Size, Weight and Power (SWaP) footprint, suitable for Group-4 Unmanned Aerial Vehicle (UAV) platforms.**

Technological Challenge/Risk: **Reducing weight and size while attaining the desired mainlobe gain, mainlobe beamwidth, and sidelobe levels across the operational bandwidth.**

Transition Program: PEO IWS 6, Cooperative Engagement Capability Program Office

Topic Author: Onekki Christian, IWS 6, Washington Navy Yard

Topic Number: N181-038

Topic Title: Gaming for Conceptual Network Learning for Naval Air Defense

Technology Objective: Develop an interactive graphics-oriented training game that instructs the conceptual, non-intuitive value of an integrated Naval battle force in a variety of realistic anti-air warfare scenarios.

Technological Challenge/Risk: Devising a method to bring engaging, realistic simulations to the warfighter

Transition Program: PEO IWS 6, Cooperative Engagement Capability Program Office

Topic Author: Onekki Christian, IWS 6, Washington Navy Yard



NAVSEA SBIR/STTR

PEO IWS



Topic Number: N181-054

Topic Title: High Performance, Small Size, Weight and Power (SWaP) Clock for Unmanned Aerial Vehicles (UAVs)

Technology Objective: Develop a high performance, reduced Size, Weight and Power (SWaP) time and frequency reference for Navy Unmanned Aerial Vehicle (UAV) applications.

Technological Challenge/Risk: Reducing weight and size while maintaining and/or increasing timing and frequency accuracy for a UAV.

Transition Program: PEO IWS 6, Cooperative Engagement Capability Program Office

Topic Author: Onekki Christian, IWS 6, Washington Navy Yard

PEO IWS 9

NAVSEA SBIR/STTR PEO IWS



Topic Number: N181-053

Topic Title: Leveraging a Robust Data Architecture for Rapid Combat System Integration, Testing, and Certification

Technology Objective: **Provide architecture, tools, and processes that streamline the development and integration of combat system software in order to add and update warfighting capabilities quickly**

Technological Challenge/Risk: **Reducing risks for long development cycles and poor interoperability results**

Transition Program: PEO IWS 9, AEGIS Program Office

Topic Author: Brian Womble, IWS 9, Washington Navy Yard

PEO CARRIERS

NAVSEA SBIR/STTR PEO Aircraft Carriers



Topic Number: N181-071

Topic Title: **Eliminating Adverse Impact of Copper Contamination in Jet Propellant 5 (JP-5) Fuel**

Technology Objective: **Mitigate the adverse impact of the presence of copper in JP-5 fuel by preventing copper contamination or removing copper that has leached into the fuel.**

Technological Challenge/Risk: Copper may be introduced to JP-5 fuel through the supply infrastructure and through shipboard copper nickel fuel lines. The presence of copper in JP-5 fuels creates maintenance and repair issues for aircraft engines and impairs performance capability. **The challenge is to develop an affordable copper removal/mitigation system to work within in existing fuel distribution systems and restricted volumes.**

Transition Program: PMS 312, In-Service Aircraft Carriers

Topic Author: Daniel Goodwin, PEO Aircraft Carriers, Washington Navy Yard

CLOSING REMARKS

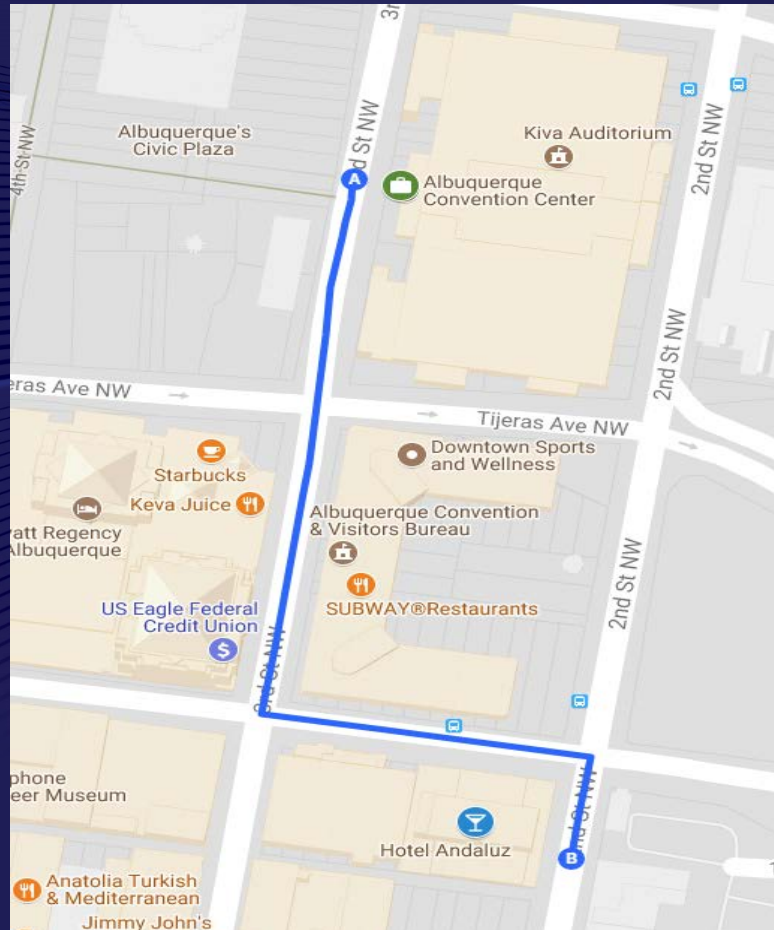
STATEMENT FROM CONGRESSWOMAN



Michelle Lujan Grisham

CLOSING REMARKS

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